THE IRON AGE

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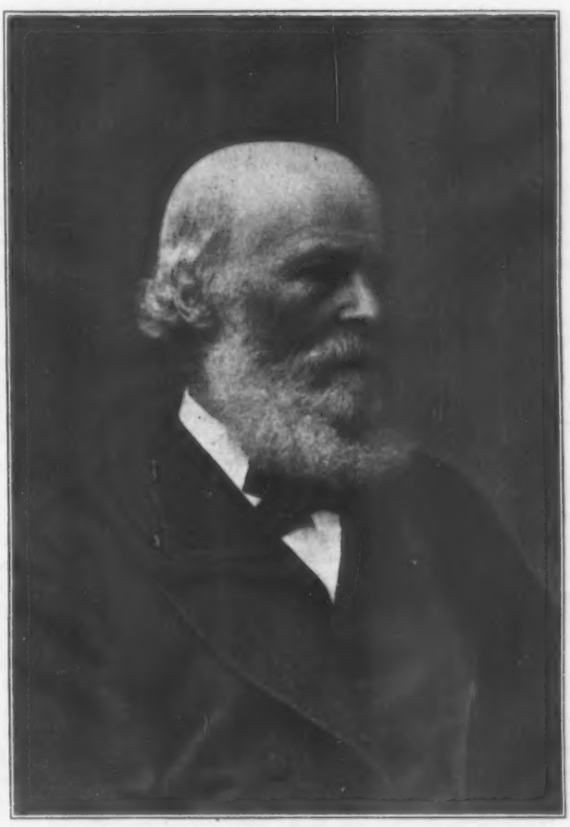
THE IRON AGE

THURSDAY, DECEMBER 29, 1904.

Sir Lowthian Bell.

In the death of Sir Lowthian Bell the iron industry has lost one of its greatest leaders, a man who during his long life was ever foremost as one of the most painstaking and keenest of the investigators of its technical problems. A man of large affairs during the whole of his career, he possessed the characteristics of a scientist and a student. During nearly the whole of his business life he was at the head of the Clarence Works, at Middlesbrough, one of the largest concerns in Great Britain producing pig iron. He was for a generation one of the active directors of one of England's leading systems—the North Eastern Railway. He served as a member of Parliament for a number of years, and was made a baronet in recognition of his services.



Lowthian Bell

To American ironmasters Sir Lowthian Bell was best known as one of the pioneers in the scientific investigation of the phenomenon of the blast furnace, the fruits of many years of experiment, study and research having been first laid down in the monumental work, "The Chemical Phenomena of Iron Smelting," which was published in 1872, and has become one of the classics of the metallurgy of iron.

Nearly all Sir Lowthian's contributions to the development of iron manufacture have been printed in the *Transactions* of the Iron and Steel Institute. He was one of the founders of that famous technical society and occupied the chair as vice-president at the inaugural meeting in London on June 23, 1869, at which the first president, the Duke of Devonshire, delivered his address. It was Bell who presented the first paper, at the first technical session, at Middlesbrough on September 22, 1869, entitled "The Development of Heat and Its Appropriation in Blast Furnaces of Different Dimensions."

He was president of the Institute from 1873 to 1875, and in 1874 was the first to be awarded the Bessemer gold medal.

In 1876 Isaac Lowthian Bell was one of the jurors of the Centennial Exhibition, and during his visit to this country read a historical paper on June 21 before the American Institute of Mining Engineers on "The Hot Blast, with an Explanation of Its Mode of Action in Iron Furnaces of Different Capacities." He was one of the first men elected an honorary member of the Institute.

The last visit which Sir Lowthian Bell made to this country was on the occasion of the first American meeting of the Iron and Steel Institute, and it was he who contributed a clear and thoughtful review of our industries to the special volume issued on that occasion. Through a number of visits Sir Lowthian Bell kept in close and sympathetic touch with the development of the iron industry of this country, and it was only the sad affliction of his declining years—blindness—which prevented the Nestor of the iron industry from carrying out the cherished plan of taking part in the second visit of the Iron and Steel Institute this year.

While during all his life he was most closely identified with the improvement of the iron smelting process, Sir Lowthian Bell keenly followed collateral branches of the subject. The fruit of prolonged labors in one line of important research was a paper read in 1878 on "The Separating of Phosphorus from Pig Iron by the Use of Fused Oxides." The researches made were the basis of a promising pig washing process, which, however, was soon lost sight of through the rapid development of the basic process which Thomas gave to the world soon after.

Sir Lowthian Bell, with special facilities and interests through his connection as a director of the North Eastern Railway, was a very close observer of the wearing qualities of rails, and during the closing years of his life prepared an extraordinary monograph, for private circulation on that subject.

Until the last he was mentally exceedingly active, although physically disabled through blindness, which prevented his taking an active part in the management of the large works which were his creation. Although over 88 years of age (he was born on February 15, 1815), he kept in close touch with the world's interests, spending nearly all of his time, however, at Rounton Grange, a charming and quaint estate in the vicinity of Northallerton.

The Fox River Valley Manufacturers' Association.—This organization held its annual banquet at the Hamilton Club, Chicago, Wednesday evening, December 14. There were 40 members of the association present and they entertained as the guest of the evening John E. Wilder, president of the Illinois Manufacturers' Association. E. C. Hobbs, the newly elected president of the Fox River Valley Manufacturers' Association, made a short address and introduced D. W. Simpson, president of the Wilcox Mfg. Company, Aurora, Ill., who acted as toastmaster. The subsequent proceedings were greatly enjoyed by those present. The Fox River Valley Manufacturers' Association has been organized only a short time, but has already made itself felt in several directions, notably in the settlement of a bitterly contested strike and the complete defeat of the closed shop idea in Aurora, Batavia, St. Charles, Elgin and other manufacturing centers in the valley.

The Central Chair Company's plant of Indianapolis burned December 18. The estimated loss is $40,000.

The Regulation of Corporations.

The Administration's plan for dealing with the so-called trusts was made public December 21 in the first annual report of Commissioner James R. Garfield of the Bureau of Corporations. He recommends the adoption of a compulsory Federal license or franchise system for all corporations doing interstate business, and practically giving the Government control over all trusts. He discusses the plan for Federal incorporation, but discards it in favor of the license or franchise scheme, which, he says, avoids the legal difficulties of national incorporation as well as the practical one of centralization of power, and gives the national Government direct regulation of the agencies of interstate and foreign commerce. "So far the commerce clause of the Constitution has had a negative development only, both under Congress and by judicial interpretation. With the exception of the Interstate Commerce Act—the force of which has been seriously weakened by judicial interpretation—and the navigation laws, there has been no really affirmative attempt to regulate interstate commerce. The commerce clause has been chiefly used to prevent the interference by States with interstate commerce."

The principal features of the Federal franchise system recommended by Mr. Garfield are as follows:

1. The granting of a Federal franchise or license to engage in interstate commerce.

2. The imposition of all necessary requirements as to corporate organization and management as a condition precedent to the grant of such franchise or license.

3. The requirement of such reports and returns as may be desired as a condition of the retention of such franchise or license.

4. The prohibition of all corporations and corporate agencies from engaging in interstate and foreign commerce without such Federal franchise or license.

5. The full protection of the grantees of such franchise or license who obey the laws applicable thereto.

6. The right to refuse or withdraw such franchise or license in case of violation of law, with appropriate right of judicial appeal to prevent abuse of power by the administrative officer.

After enumerating the six essential features of such a system as given above, Mr. Garfield says:

No fundamental legal difficulty can be discovered in this plan. Congress would grant to corporations that meet the proper conditions power to engage in interstate commerce; would fix the conditions under which their business should be done in such manner as to remedy the present defects in the State corporation law, and would require all corporations and corporate agencies engaged in interstate commerce to make returns to a Federal bureau, showing the amount and nature of the business done and such other facts as may be desired. Furthermore, this plan obviates the difficulty regarding State taxation. Inasmuch as practically all the important corporations of the present time are engaged in interstate commerce, and as the United States has the right to fix conditions to this license to engage in interstate commerce, this system would enable the Federal Government to reform the present condition of corporate business in all its important features.

In an appendix to the report, in which he goes into the details of the system, Mr. Garfield dismisses the idea of making the Federal franchise optional, and says that it is necessary to make it compulsory. He says:

In order to have a Federal law of any public benefit, it must impose conditions upon corporations which from the strict standpoint of those interested in the corporation would be objectionable, inasmuch as the law must protect the public as well as the corporation. To this extent, therefore, those about to form a corporation would prefer the State law. Any such arrangement would reduce the United States practically to the position that an individual State holds now. The United States would merely offer one form of corporation law; forty-five different forms are offered now by the different States.

If corporations now do not choose to avail themselves of the known merits of the Massachusetts law, for instance, rather than the piratical possibilities of the laws of certain other States, it is hardly likely that they would avail themselves of a properly drawn Federal law.

It has been especially obvious that within the last two or three years the majority, perhaps, of the great corporations have been formed not with a view to their future or to their business stability, but with a view to the stock market and the issue of stock, and a promoter having this latter purpose in mind would care nothing about the enhanced reputation given by a sound corporate act, but would care a great deal about the enlarged possibilities of stock manipulation given by loose State law.

Mr. Garfield says that the law "should endeavor to correct, as far as may be, those peculiar evils inherent in the corporate form as such, for instance, lack of personal responsibility of managers, improper use of stock as a kind of currency, lack of proper publicity as to terms of organization, overcapitalization, &c." Proceeding, he says:

It should be noted that either a Federal incorporation law or a Federal license law involves a practical difficulty which is substantially new to our governmental operations—*i.e.*, either system requires the dividing of the business of the country into two great classes, interstate and domestic, for the purpose of jurisdiction over corporations. This has never been done before administratively. All that has been done so far is for the court to say in specific cases, with all the facts before it after a long trial, that such and such an act was or was not interstate commerce.

The Commissioner declares that the Federal franchise system should include a requirement for annual reports from corporations as to their business of such a nature as to show whether it is interstate or not, the details of organization, the property, terms of subscription, bond indebtedness, and interests of promoters therein, *personnel* of the management, number of stockholders, contracts with promoters "and with financial interests in the organizing of the company," financial condition, and other matters which he enumerates.

In his discussion of the evils with which the franchise system is to cope he says: "Commercial and industrial conditions present the foremost problems of to-day. There exists a deep rooted general feeling of dissatisfaction with existing conditions. Some causes of dissatisfaction are apparent and the evils very real and great." Continuing, he says:

The present legal conditions under which corporate business is carried on are extremely unsatisfactory. They admit of and invite extreme abuse. They are the result of forced growth under divergent pressures, and in their present anomalous state represent the needs or demands of special interests, and are not a permanent body of law adapted to provide properly for all the interests involved.

Furthermore, the "State system," applied to interstate businesses, has developed additional and peculiar evils; a diversity so great as to amount in operation to anarchy; an inevitable tendency toward the lowest level of lax regulation, and the unequal and disastrous contest between State Legislatures and commercial forces of national size and power.

He declares that as Government creates corporations "it is logical and necessary that governmental regulation of corporations should be much more stringent and detailed than the regulation of individual business. The concentration of business that has resulted from the use of the corporate form has produced entities that are almost equal in power to the State itself; that can meet the State on equal terms and influence it accordingly. By their size and legal permanence and their peculiar privileges they have crossed the line that divides private from public interests, and their operations affect the public in much the same manner as the operations of Government." Elsewhere he says:

A study of the present body of corporation law shows the impress of the forces that have shaped it. First in prominence is the force represented by the masters of industry, the interests that are peculiarly connected with production, transportation and exchange. Second, the purely financial interests as distinguished from production, in which class the organizer or promoter, so called, is conspicuous. Third, the creditor class, whose interest is in the security for loans or credit; and in somewhat similar position those stockholders who under present forms of combination, by preference or other device, have taken stock in exchange for property, and, in effect, consider themselves creditors rather than responsible owners of corporate stock. Fourth, the labor interests, and finally the State as a taxing body, and, to a very limited extent, as a guardian of public welfare. The interests of the consumer have so far had very little effect upon legislation of this sort.

In summarizing his discussion Commissioner Garfield declares his belief that the compulsory Federal incorporation scheme is probably legally practicable, "but," he says, "it involves radical industrial and political changes by the centralization of power in the Federal Government, and presents serious difficulties because of its effect upon the authority of the States over such corporations in matters of taxation and local regulation. Any optional law of this character would not overcome these difficulties."

W. J. Stoop has been appointed superintendent of the slabbing and plate mills of the Lackawanna Steel Company, Buffalo, N. Y., to succeed J. P. Shaddick, who resigned to take a position in the steel mills at Lorain, Ohio.

The Bonynge Trade-Mark Bill.

Reported With Favorable Recommendation.

WASHINGTON, D. C., December 27, 1904.—The Bonynge trade-mark bill, the leading features of which were presented in this correspondence a week ago, has been reported to the House with a favorable recommendation, and an effort will be made to secure its consideration immediately after the holiday recess. In view of the fact that the bill is now satisfactory to all the numerous interests that have advocated various measures during the current Congress, there is good reason to believe that favorable action by both House and Senate will be taken this session.

Important Changes in the Bill.

In reporting the bill to the House the committee found it necessary to make a number of important changes in the text of the measure. By an amendment to Section 2, it has been provided that an applicant for a trade-mark residing in a foreign country, who is required to set forth the fact that the mark claimed by him has been registered or an application for the registration thereof has been filed by him in the country in which he is located, is relieved from the necessity of showing that the mark has been used in commerce with the United States or among the States thereof, as is required if he is a resident of this country. For the purpose of enabling the owners of old trade-marks to register them in the Patent Office some very comprehensive changes have been made in Section 5. This section, as reported to the House, provides:

> That nothing herein shall prevent the registration of any trade-mark used by the applicant or his predecessors, or by those from whom title to the trade-mark is derived, in commerce with foreign nations or among the several States, or with Indian tribes, which was in actual and lawful use as a trade-mark of the applicant, or his predecessor from whom he derived title, for ten years prior to the passage of this act.

This change has been made because of a demand for an opportunity to register old marks in the Patent Office and thus enable their owners to enjoy the same privileges as the owners of new trade-marks, who may defend them in the Federal courts. The expectation is that the adoption of this amendment, if the bill is passed, will result in a comparatively short time in the registration in the Patent Office of practically every trade-mark which has not been abandoned. The value of such a complete record, especially to manufacturers who may be engaged in an attempt to devise new marks eligible to registration, is obvious.

An important amendment has been added to Section 10 for the purpose of preventing frauds through the duplication of assignments of trade-marks by the owners thereof. The original bill granted to trade-mark owners the right to assign their marks "in connection with the good will of the business in which the mark is used." As amended, the assignments must be recorded. The section as reported is as follows:

> That every registered trade-mark, and every mark for the registration of which application has been made, together with the application for registration of the same, shall be assignable in connection with the good will of the business in which the mark is used. Such assignment must be by an instrument in writing and duly acknowledged according to the laws of the country or State in which the same is executed; any such assignment shall be void as against any subsequent purchaser for a valuable consideration, without notice, unless it is recorded in the Patent Office within three months from date thereof. The Commissioner shall keep a record of such assignments.

A provision for an appeal to the Commissioner of Patents from any decision of the examiner of interferences is provided by Section 14 of the bill as amended. This section authorizes any one who shall deem himself injured by the registration of a trade-mark to apply to the Commissioner of Patents to cancel it. The Commissioner is required to refer such application to the examiner in charge of interferences, who is empowered to hear and determine the question, and who must give notice thereof to the registrant. If it shall appear after a hearing before an examiner that the registrant was not entitled to the use of the mark at the date of his application for registration thereof, or that the mark is not used by the registrant, or has been abandoned, and the examiner shall so decide, the Commissioner is required to cancel the registration. Appeals may be taken to the Commissioner in person from any decision of the examiner.

Additional Fees Prescribed.

The very moderate schedule of fees as provided by the Bonynge bill has been supplemented by two provisions that will bring in considerable revenue without constituting a heavy tax upon registrants. An applicant for the renewal of the registration of a trade-mark, which under the proposed law is good for 20 years, is required to pay $5, while any one filing notice of opposition to the registration of a trade-mark must pay a fee of $10. It has been deemed advisable to place a check upon the filing of notices of opposition by imposing a fee which, while not prohibitory, will prevent irresponsible persons from making a business of opposing registration in the hope that their claims may subsequently be settled by purchase.

In submitting the modified bill to the House with a favorable recommendation, the committee devotes considerable attention to the important question as to whether trade-marks bear sufficient relation to commerce in general to bring them within Congressional control, and whether a law providing for the registration of trade-marks used in foreign and interstate commerce and commerce with the Indian tribes is a regulation of such commerce. That a trade-mark is generally accepted as bearing a very close relation to commerce is evident from its name, its origin, its history and the legislation upon the subject of trade-marks in nearly all the States of the Union and the leading commercial nations of the world. There is no right to the use of a trade-mark which is separate and distinct from its application to goods used in commerce, and there can be no ownership of a trade-mark which is not so used. In many respects it bears a striking resemblance to the good will of a business. Every commercial nation of the world of any importance has a law regulating the registration and protection of trade-marks, and with these considerations in view the committee contends that the use of a trade-mark bears "a very close and intimate relation to commerce."

Constitutionality Never Tested.

It is an extraordinary fact that the question of the constitutionality of the various Federal trade-mark laws heretofore enacted has never been raised or discussed in the United States courts, and the committee finds itself obliged to determine the question upon such analogies as can be derived from the utterances of the courts with regard to the general subject of commerce. Citing the case of Gibbons vs. Ogden (Wheaton, 1), the opinion of Chief Justice Marshall is quoted in which he held that the commerce clause of the Constitution should not have a strict or narrow construction, which would cripple the Government and render it unequal to the objects for which it had been established.

Other cases are cited by the committee, including a very recent one, that of the Addyston Pipe & Steel Company vs. United States (175 U. S., 211), in which the Supreme Court held that interstate commerce included not only transportation of persons and property, "but also the purchase, sale and exchange of commodities," adding that "the power to regulate commerce means the power to prescribe rules by which it shall be governed." In conclusion the committee says: "We confidently submit that the regulation of a trade-mark comes within the power to prescribe the rules by which commerce shall be governed and controlled. Congress, however, is limited in its regulation of commerce, by the express language of the Constitution, to commerce with foreign nations, among the several States or with the Indian tribes, and its power over that subject is full, complete and exclusive."

W. L. C.

The Illinois Steel Company, International Harvester Company and Grand Crossing Tack Company, all of Chicago, have made their usual holiday closing of steel plants, work to be resumed January 2.

The Latest Hendey-Norton Lathe.

An increased producing capacity was the main object sought in the design of the new Hendey-Norton lathe, which has just been brought out by the Hendey Machine Company, Torrington, Conn. This is accomplished through improved facilities for the quicker handling of work and the making of necessary changes for the various operations of turning, thread cutting, &c. Fig. 1 shows the general appearance of the complete lathe and Fig. 2 gives a view of the unassembled parts which make up the Hendey-Norton lathe head, including the taper bearing, self oiling form of spindle, with annular form of journals carried in annular housings, each housing having a large oil pocket in which a ring oiler for the bearing is suspended to furnish constant lubrication while the lathe is running. The certainty of ample lubrication, coupled with the rigidity of the bearings, makes these lathe heads long lived in alignment and wear. An inspection and tests made of a lathe head, with this form of bearing, after six years' continuous service in the shops of the company showed the bearing to be practically as good as when first assembled, and the alignment of the spindle was found to have been maintained with no perceptible change. Due to its strength and rigidity a three-step cone driving pulley may be used in place of the four-step cone when it is desired to get more power in the spindle drive for high speed steel work. As with all Hendey-Norton lathes, both belts to the countershaft are run in the cutting direction; the two countershafts speeds in connection with a three-step cone and the back gears give 12 different spindle speeds, or two more than are obtained with the ordinary type of lathe having a five-step cone.

The way in which the parts of the head stock go together is indicated in the sectional view, Fig. 3. To remove the spindle the guard K and the collar L are taken off; then, by turning back the collar E and simultaneously driving the spindle forward with a babbitt hammer, it may be removed. In replacing it the collar E is turned up until the face gear M is tight against the bearing A, then the collar E is turned back enough to allow the cone pulley to run freely. The gear J is next put on and the collar L adjusted to take up the end play of the spindle. The front bearing and thrust collar are so proportioned that the wear is correlative. All end adjustment is obtained by collar L. The rear bearing is entirely independent of the spindle and is adjusted by turning the collar L forward or backward as may be needed. The front bearing A is adjusted by a collar on the inner end of the box. The oil reservoirs are filled from the top until the oil shows in the oilers at the front of the bearings. When it is necessary to remove a bearing the spindle is taken out and the sleeve of the rear bearing is withdrawn, then with a block of wood and a light hammer the rear box may be driven out, after first raising

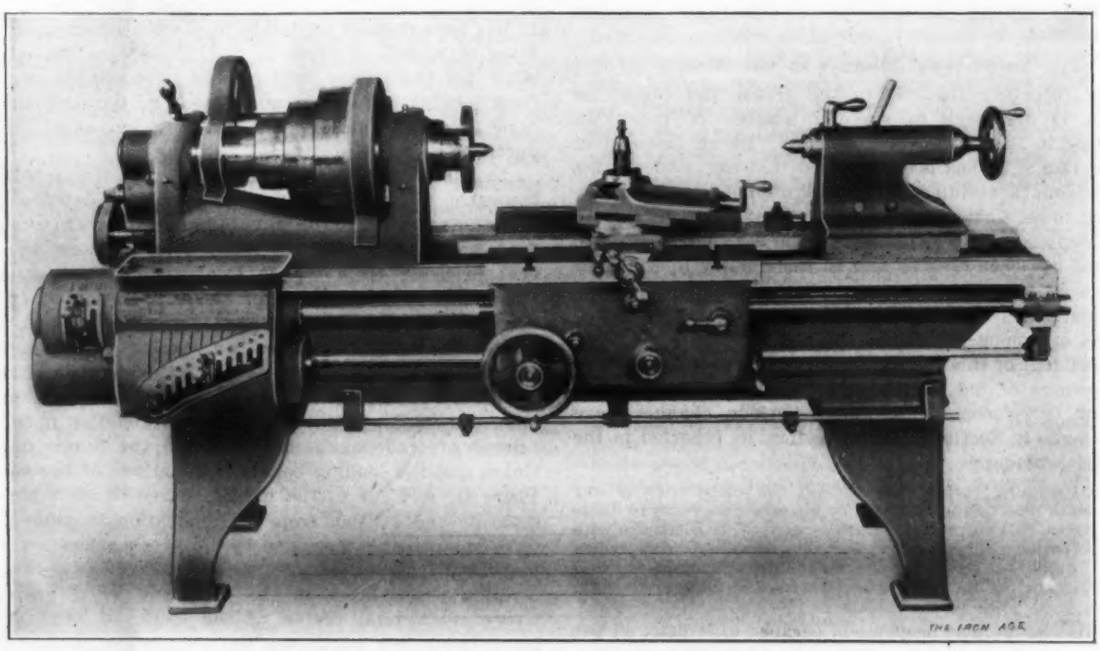


Fig. 1.—General View of the New Hendey-Norton Lathe.

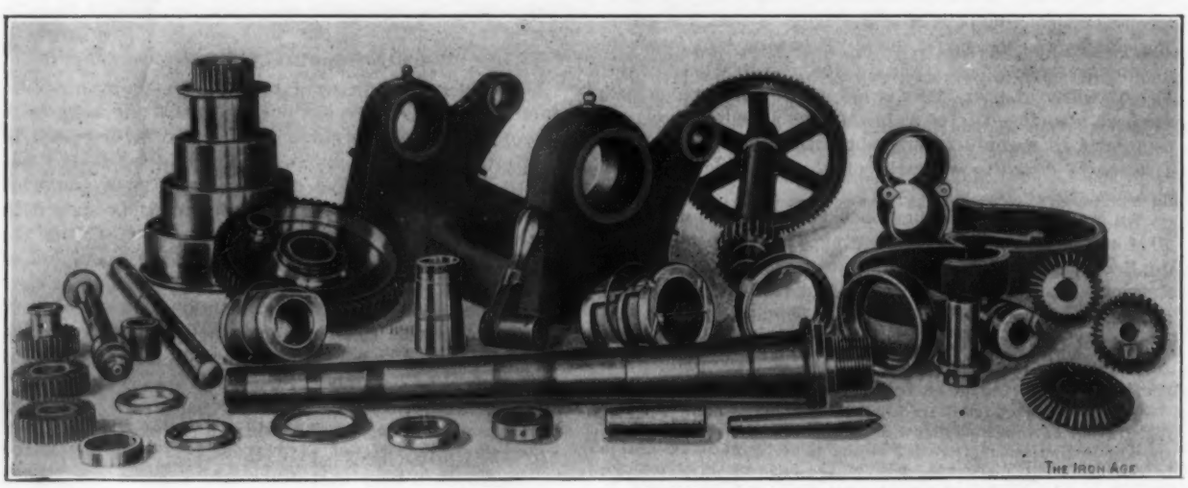


Fig. 2.—The Parts of the Head of the Hendey-Norton Lathe.

the oil ring in its slot. The front box is removed in a similar way when the retaining collar has been unscrewed.

The sliding gear just below J is never entirely out of mesh with the gear just below it, but may be completely disengaged from J when the carriage feed is to be thrown out. The manner of driving the intermediate gear shaft, shown at the lower left side of Fig. 3, in either direction will be readily understood from the drawing. It carries a gear on the outer end (not shown) which meshes with always in one direction, and giving double the number of spindle speeds, as before mentioned.

The automatic stop for the carriage works in conjunction with the apron reversing device, and is of great value in thread cutting or boring to a required length or depth, and in turning a number of pieces to a given length. Connected with the reversing clutch in the head is a rod running parallel with lathe bed, passing through a bracket attached to apron, as clearly shown in Fig. 1. The rod carries two stop dogs which may be clamped at

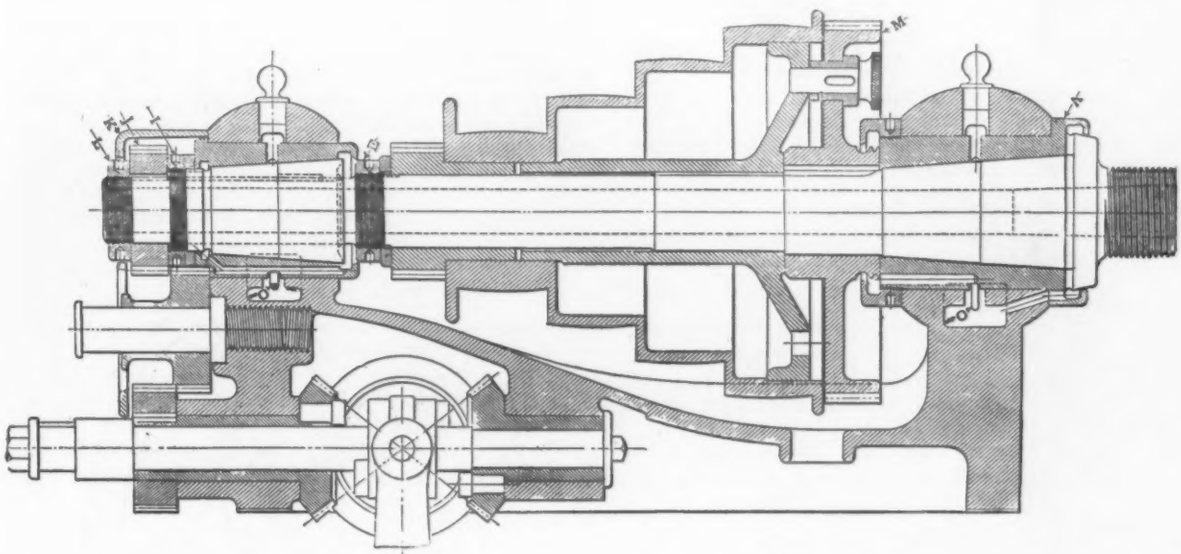


Fig. 3.—Sectional View of the Head.

the driving gear in the cone gear box, which gives the various speeds to the lead screw.

Of chief importance is the new compound gear box, which is applied to all sizes of these lathes of from 12 to 20 inch swing. The device, a rear view of which removed from the lathe is shown in Fig. 4, gives a broad range of threads and feeds, the former ranging from 1½ to 80 per inch and the latter from 7½ to 400 per inch. The threads available in this range are all standard pitches, and the gearing on the sector of the lathe is so arranged as to be easily changed so that any special thread or threads

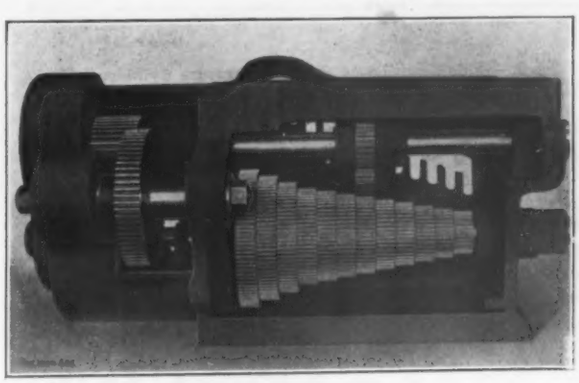


Fig. 4.—Rear View of the Gear Box.

not found on the index plate may be cut with a special gear. This gear, working through the whole 36 combinations, often makes possible the cutting of other useful threads.

The carriage reversing device, while not a new feature of the Hendey lathes, may be unfamiliar to the reader. It consists of a sliding clutch in the lathe head, operated and controlled by the lever at the right side of the apron, Fig. 1. This clutch gives right and left travel to the lathe carriage through the lead screw and a train of gearing, doing away with the necessity of a cross belt to the countershaft, allowing the spindle to run any point, and when encountered by the apron bracket as the carriage travels, move the rod forward in the direction of the travel until the clutch is released in the head, stopping the train of gears, the lead screw and the carriage. This stop is invaluable in working to and from shoulders, either for internal or outside work, as it allows the spindle to be run constantly at working speed.

The cross slides of all lathes are made to standard size on the tool rest seat, to take any one of four interchangeable tool rests; the compound, the Homan patent, the quick elevating and the plain, which is always furnished with the flat carriage. The rise and fall rest does not interchange with the others. Every lathe is run and tested before being shipped, and the results of the test are put on a test sheet, which is sent with the lathe for inspection and comparison if desired.

The addition of steel gearing wherever necessary, beds and parts made heavier than formerly, increased diameters of spindle noses for heavy chuck work, coupled with the improved features as mentioned, including the improved head stock, the automatic stop and the apron reverse for the carriage, have greatly added to the popularity of this lathe for all round machine work as well as in the tool room.

Inventory of the B. F. Jones Estate.—An inventory of the personal property of B. F. Jones, deceased, formerly chairman of the Jones & Laughlin Steel Company, at Pittsburgh, has been filed. It shows the estate to be valued at $17,236,663.66. By the time this was distributed among the heirs under the will it had so increased that the gross amount for distribution was $18,006,536.56. Of the estate, $349,499.84 is in cash, $14,870,615 in stocks, $300,000 in notes of the Jones & Laughlin Steel Company and $56,719.82 was due from heirs of the estate. The largest holding of stock was in the Jones & Laughlin Steel Company. Mr. Jones had 101,400 shares of this stock, the appraised valuation being $11,618,412. In addition to the stocks held by Mr. Jones he had bonds in different companies to the amount of $1,649,089, holding bonds of the Jones & Laughlin Steel Company to the value of $809,000.

The Hoffman Rotary Engine.

There have been so many unsuccessful attempts to build a practical rotary engine of other than turbine form that every new one is received with suspicion. It is said there have been some 2000 rotary engines of various types patented, and not one of them is in practical use to-day. So far as is known the Hoffman rotary engine is the first which has reached the stage of commercial manufacture. The General Engine Company, Buffalo, N. Y., which was reorganized last April, has increased its capitalization to $2,000,000, and, it is stated, will manufacture this new type of engine upon a large scale.

The inventor of the engine, Wm. M. Hoffman, Buffalo, N. Y., began his first work on the problem over 25 years ago. Again and again he failed, until with his sixth engine he was able to enlist the support of some New York capitalists, but this engine also proved a failure. The seventh engine ran for 4½ months, but still was not satisfactory. The eighth and ninth engines were a little better, but they could not be controlled or regulated. Finally, he conceived the idea of revolving the cylinder instead of the piston, and this he was confident was the secret of success. The first engine on this model developed 28 horse-power, and was used in running the inventor's shop. It saved 25 per cent. in steam, used one-fourth the floor space of an equivalent reciprocating engine and was without vibration. The latest engine is one of 300 horse-power, and is a form that is capable of compounding and installing in units. It is affirmed that it is the smallest, most economical and fastest engine for its power ever built.

The general construction and mechanical operation are shown in the three accompanying drawings, Figs. 1 and 2 being end elevations of the high and low pressure cylinders respectively, with the heads partially removed to show the interior. Fig. 3 is a horizontal section, in which the letters represent the various parts similarly lettered in the end elevations.

In Fig. 1 *c* represents the cylinder which revolves around the stationary hollow shaft *z* on its hollow shaft or hub *s*; *a a'* represent the blades or pistons, which are extended into the cylinder automatically during a revolution and receive the impact of the steam. These blades are each carried between two circular plates *p* and *p* and *p'* and *p'*, forming a segment of a ring between the two plates. The plates extend into the housing provided for them in the cylinder heads and partition wall between the two cylinders, as shown in Fig. 3. *k* is an elliptical shaped stationary core, held in position by the stationary hollow shaft *z*, these being supported by the standards 12 12', shown in Fig. 3. The elliptical cams are so shaped as to conform to the curve of the interior of the cylinder for a distance little less than one-half of its circumference, but are not allowed to come in contact with the cylinder at any point, thus avoiding all excessive face travel and consequent undesirable friction on the interior of the cylinder *c*.

The stationary cores in the respective cylinders are so located, as shown in the drawings, as to bring the extreme radial throw of one below the center of the cylinder and the other above, thus causing one elliptical cam to actuate and hold the blades in contact with the other throughout the entire revolution, and *vice versa*. This action is accomplished through the wrist pins *b* and *b'*, which carry the blades and the countershafts *d* and *d'*, which extend across the entire engine, together with the segmental gears *w w* and *w' w'*, Fig. 1, and the cranks *w w* and *w' w'*, Fig. 2, and connection rods *n* and *n*, Fig. 2. When the blade *a* in the high pressure cylinder (Fig. 1) is being forced into its housing *h* by contact with the elliptical cam *k*, the wrist pins *b* transmit through the segmental gears a motion the reverse of its own to the countershaft *d*, causing the opposite blade in the low pressure cylinder to be extended from its housing by means of the cranks *w* and *w*, Fig. 2, and maintained in contact with its respective ellipse. In an identical manner the other blades *a'* are kept in constant contact with their respective stationary cores. In Fig. 1 *g* and *g'* are circular shoes or gudgeons at the ends of the blades, curved to conform to the ellipses. These shoes are carried by the pins *m* and *m'*, which extend into the plates *p* and *p'*, as shown in Fig. 3, and are provided with packing bars to insure a perfect steam tight contact with the cams *k*.

In this engine one blade in each cylinder receives the impact of the steam, while the other acts as a packing bar to close whatever opening there may be between the lower curve of the cam *k* and the interior of the cylinder, and also as a means for actuating the opposite blades in their respective cylinders. *y''* in Figs. 1 and 2 are spring

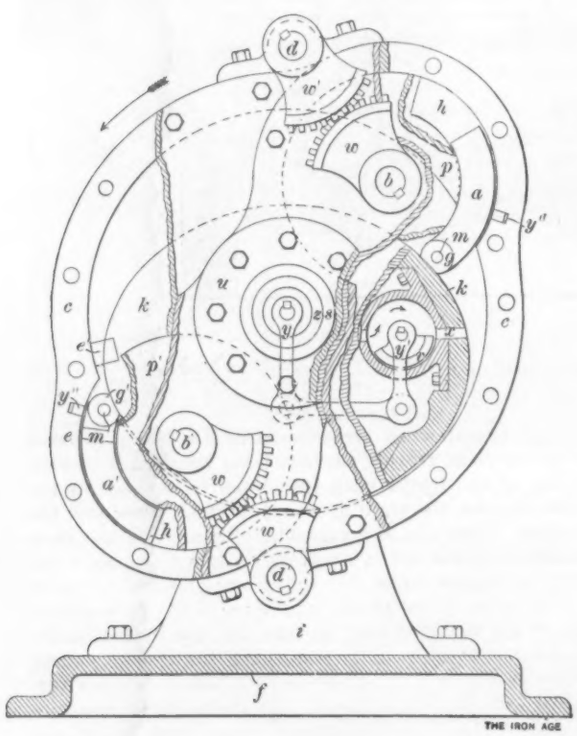


Fig. 1.—End Elevation of the High Pressure Cylinder.

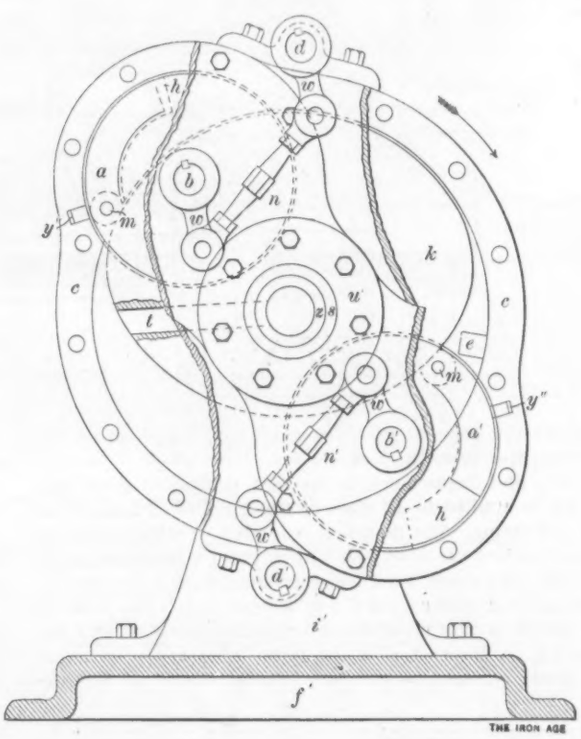


Fig. 2.—End Elevation of the Low Pressure Cylinder.

packing bars in contact with the face of the blade to prevent steam from passing over the top of it to the exhaust ports.

In Figs. 1 and 3 *y* is a rocking valve stem, which through the rod *n* and crank *y'* transmits motion to the valve *v*, for the proper regulation and timing of the steam admission. The rod *y*, which extends from the stationary hollow shaft to the interior of the ellipse, is oscillated by the device shown in Fig. 3, 2 being a hood securely fastened to the revolving hub *s*, and from which is suspended by the arm 4 the eccentric and eccentric strap 5, these being when in normal position eccentric from the hub of the engine. The motion of the eccentric is imparted to the rocking stem *y* by the rocking shaft 8 and the connecting rods and levers 6 and 7. The eccentric has an oblong opening allowing it to swing on the arms 4, from the position of its greatest eccentricity, when imparting full motion to the valve *v*, to a position concentric with the shaft *s*, when it completely closes and imparts no motion to the valve *v*. The arm carrying the eccentric is provided with proper weights to throw the eccentric out of motion when excessive speed is attained, and being provided with springs to hold the eccentric in normal position is a means of operating the timing valve as well as the automatic cut off.

In the different figures *i* represents the standards which are provided with roller bearings in which the engine revolves upon its hub or main shaft *s*. In Fig. 3 15 is the drive pulley, which may be allowed to overhang the stuffing box, as shown, in order to economize the space on the bed *f*.

In operation, steam is admitted through opening 3, Fig. 3, and the hollow shaft *z*, into the interior of the cam *k* in the high pressure cylinder, Fig. 1, from whence it flows into the cylinder through the port *x*, and is so regulated by the valve *v* as to allow it to enter the cylinder when the blade *a* is slightly in advance of the position shown. As will be seen the blade *a* at this point is extended into the cylinder so as to expose a considerable area to the steam, and, being carried by the movable cylinder *c*, causes the cylinder to revolve in the direction indicated. The steam expands against blade *a* until the blade *a'* has arrived at the starting position of *a*. The area exposed by *a'* is then equal to that exposed by *a*, consequently no further benefit could be derived from the expansion of steam in this cylinder. At the next instant *a'* has extended into the cylinder sufficiently to allow the expanded steam to exhaust through its port *e* into the low pressure cylinder, as shown in Fig. 2, where it is further exhausted. The relative positions and consequent areas exposed by the blades in the low pressure cylinder are at this point the same as those in the high pressure cylinder when the steam was admitted, and consequently the force of the expanding steam continues to be exerted in the same direction. The steam expands until this working blade arrives at the exhaust port *t*, where the steam escapes through the hollow ellipse *k* and hollow shaft *z*, Figs. 2 and 3, to the atmosphere or condenser.

During the half revolution, while the steam is expanding in the low pressure cylinder, the blade *a* in Fig. 1 is under the ellipse and presents no area to the steam and the blade *a'*, which is then extended into the cylinder, has the opening *e* through it for the free passage of the steam. There is no back pressure on the high pressure piston, although the steam is being expanded in the low pressure cylinder. This is a condition which is decidedly unique, as it is impossible in any other form of steam engine. It affords efficiency in the extreme expansion of steam and consequent economy, which, with the mechanical construction of the engine, has given some wonderful results.

The principal features in this engine which have led to its success are not at first apparent, and are due to a mechanism vitally different from anything that has ever been attempted in the line of a rotary engine. Among these is the fact that the engine is positively steam tight, cuts off the steam at any point in the revolution and works expansively through any portion of the revolution that is found to be efficient and economical, and this without any packing bars or other devices acting in contact with the interior of the cylinder where, on account of the great face travel, it would cause an excessive friction. Another feature which is considered a vital point is that the steam cannot force the blade down in contact with the cam *k* to cause undue friction. This is prevented as the steam pressure on the blade is always on a radial line with the center of the wrist pin *b*. Neither does the steam pressure force the blades against the walls of the housings *h*, for, as the blade is carried from the wrist pin *b*, the entire piston load is received on this pivotal point. This moves with only a slight oscillating motion as the blade is extended and withdrawn, consequently the friction is slight.

The pistons transmit force to the revolving cylinder through the wrist pins *b*, so that the steam is always exerting its force at an equal distance from the center of the main shaft. This is desirable mechanically, and cannot be obtained in a reciprocating motion transmitted through a crank.

As will be seen from the figures, the only contact in the interior of the cylinder, aside from the packing bars *y''* on the face of the blades, is the circular shoe, traveling on the periphery of the stationary ellipse, which is

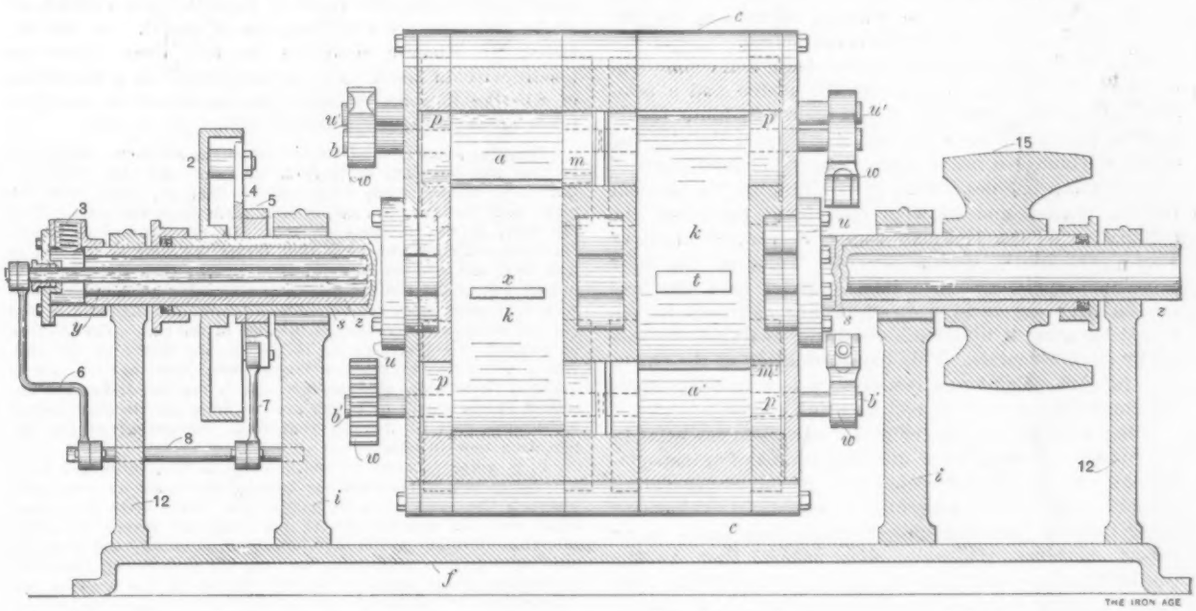


Fig. 3.—Horizontal Section of the Hoffman Rotary Engine.

under only the slight pressure maintained by the spring packing in the shoe to make a steam tight joint. This pressure, on account of the location of the pivotal point of the blade, remains constant, being neither increased nor diminished by steam pressure on the piston. The friction of the engine therefore does not increase under load, as has been the result in all previous steam tight rotary engines. It might be well to note that this engine does not operate on the principle of impact, as does the turbine, but admits steam by a positive valve motion, for any part of the stroke found to be efficient and economical and then retains it in a perfectly tight cylinder, with a positive abutment until the expansive effect of the fluid has been utilized to the greatest extent possible in any form of steam engine.

As the steam in the low pressure cylinder causes no back pressure on the high pressure piston, and as consequently no increased piston area is required that causes an increase in friction, this engine is capable of economically and efficiently expanding steam from any pressure to nearer atmospheric pressure than has ever before been practicable. For this reason the engine, unlike a turbine, though capable of the practical maintenance of high speeds, is not dependent upon an excessive speed for efficiency, as the speed can be diminished or increased within a very wide range without decreasing its efficiency or increasing its steam consumption.

Due to the engine's receiving its steam and consequent cylinder pressure between a movable piston and a positive nonreacting abutment, it has shown in innumerable tests as great, and even greater, elasticity in the starting of direct connected heavy loads than the present types of reciprocating engines. This is not true of the present turbine engine, and answers any doubt regarding the application of the Hoffman engine to various kinds of work, particularly marine service. Some of the most prominent engineers have lately agreed that the best results with the turbine on shipboard can only be obtained by using it to drive a generator to propel the vessel by electric motors. This transformation of the power with its consequent losses is necessary to obtain the starting power of the present reciprocating engine.

That a rotary motion for prime movers is essential to the further acceleration of different means of transportation as well as further economy in power of generating plants seems to be generally accepted. Development along this line has only quite recently been taken up by expert engineers. It would seem natural that, as Mr. Hoffman has seriously associated himself with the work for so many years, he should be the first to produce a successful rotary engine.

Recent Customs Decisions.

Agricultural Machinery.—According to a ruling handed down by the Board of United States General Appraisers December 24 agricultural machines of certain classes are subject to duty as entireties and not at varying rates on the various parts. The importation in question was made by the Massey-Harris Company, Limited, Bangor, Maine, and comprised 25 two-horse drills and planters, 10 one-horse drills and planters and one drill and turnip planter. In invoicing the articles the separate parts, though forming entireties, were separately specified, with the result that certain grain boxes and grass boxes belonging to the machines were assessed at 35 per cent. as manufactures of wood, and a "turnip and grass attachment" belonging to the "drill and turnip planter" at 45 per cent. as a manufacture of metal. The ten one-horse drills and planters were described in the entry as "sowers," and they also were assessed at 45 per cent. as manufactures of metal. The importers protested against this classification, claiming that the articles were dutiable as entireties at 20 per cent. under the paragraph of the tariff law providing for "plows, tooth and disk harrows, harvesters, reapers, agricultural drills and planters, mowers, horse rakes, cultivators," &c.

The board sustains the protest, and says that it is of the opinion that the parts assessed separately form integral parts of the machines they accompany and that "sowers" is a practically synonymous term with "planters" as used in the law.

Tin Disks.—In a decision written by General Appraiser Fischer and handed down by the board on December 22 the board overrules a protest by F. H. Shallus of Baltimore against the assessment of duty at 1½ cents a pound under paragraphs 134 and 140 of the tariff law on tin disks about one and three-quarters inches in diameter, which are a by-product in the manufacture of tin cans, and are used in this country by roofers and others to protect the material in use from destruction or injury in the process of driving nails into it. The disk forms a shoulder for the head of the nail. The paragraph of the law under which they were assessed reads as follows:

140. No article not specially provided for in this act, which is wholly or partly manufactured from tin plate, terne plate, or the sheet, plate, hoop, band, or scroll iron or steel herein provided for, or of which such tin plate, terne plate, sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terne plate, or sheet, plate, hoop, band, or scroll iron or steel from which it is made or of which it shall be the component thereof of chief value.

The importer claimed that they were dutiable either at 10 per cent. as waste or at 10 or 20 per cent. as nonenumerated unmanufactured or manufactured articles, or at 45 per cent. as manufactures of metal. In his decision Mr. Fischer dismisses the first three claims as totally without merit, and confines himself to a discussion of whether they are dutiable as assessed or as manufactures of metal nonenumerated. He says in part:

The first point counsel for the importer advances appears to be that the disks are made from tin cans, and that they are, therefore, articles made from articles that are made from tin plate, and that they are not articles made from tin plate. This argument is not founded on fact. In the process of manufacturing tin cans the piece that forms the body of the can is first bent and secured in cylindrical shape; then the bottom is put on and finally the top, which is a circular piece of tin plate with a circular piece cut out of the center, the diameter of the cut out being in proportion to the size of the can. The purpose of cutting this piece out is to permit the filling of the can, which, being accomplished, a larger piece than that cut out is soldered on to close the aperture. It is the tin disks thus obtained which, it will be noted, are cut from the tin plate before it becomes part of the can that form the subject of the importation now in question.

It is quite conceivable and, indeed, it was intimated by a witness in one of the hearings held by the board on other protests on the same class of goods, that these disks are sometimes stamped directly out of tin plates or sheets, in which case it is certainly not open to argument that they are anything else but "articles manufactured from tin plate." If, then, the contention of the importers should prevail in this instance we should have two different rates of duty for the same article, for it must be remembered the disks, in the condition as imported, differ in no respect whatever, being complete articles, fully finished and ready for use.

Agate Bearings for Scales.—In sustaining a protest by Albert Lorsch & Co. the board on December 22 decided that agate bearings for delicate scales are properly dutiable at 10 per cent. as precious stones. They had been assessed as manufactures of agate at 50 per cent.

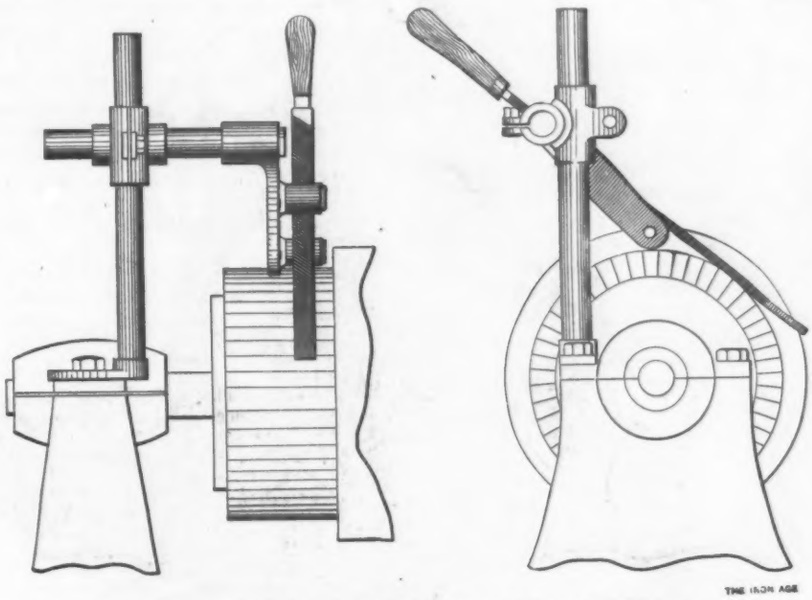
Knife Cleaning Machines.—The board in a decision handed down December 22 overruled a protest by Burley & Co. of Chicago against the classification of knife cleaning machines at 45 per cent. as manufactures of metal. The importers claimed that they were composed in chief value of leather or wood, and therefore dutiable at 35 per cent.

August Belmont was elected to succeed Marcus A. Hanna as the president of the National Civic Federation at the annual meeting of that organization held December 16, at the Park Avenue Hotel, New York. A dinner was the feature of the evening, and was attended by about 300 men of prominence in all walks of life, including large employing interests, organizations of workingmen, the press, education, the church, the law, finance and literature. It had been the expectation of prominent members of the organization that Andrew Carnegie would be elected to the presidency, but the honor was declined on the ground that his health would not permit his assuming the duties of the office. The dinner was enlivened by numerous speeches in which the relations of employer and employee were treated from diverse standpoints.

The Bosworth Commutator Filing Device.

As a means for truing generator commutators which shall be less expensive than turning them down with lathe tools the Excelsior Machine Works, Akron, Ohio, has recently placed on the market the device illustrated herewith. The simple construction and method of attaching it to a generator are shown in the illustration. One of the principal advantages is that no particular skill or previous experience in truing commutators is required to insure satisfactory results.

The supporting column for the device is provided with a suitable foot for securely attaching it under one of the cap bolts on the generator bearing. This carries a horizontal bar, which may be clamped at any desired hight. The file holder slides on the horizontal bar, so that the file may be passed across the surface of the commutator. An ordinary file is used, being held in proper position by pins or file rests in the file holder, one of which is slotted and located so as to steady the file and prevent chattering. The file is moved backward and forward over the commutator and, being rigidly secured, cuts to uniform depth, thus not only leveling the surface lengthwise, but restoring the true cylindrical form.



Two Views of the Bosworth Truing Device for Filing Commutators.

As the device is so readily applied, the commutator may be smoothed off as soon as the surface shows the first signs of roughness or unevenness and before it has become sufficiently worn to warrant the removal of the armature or the turning of the commutator by means of a cutting tool. The perpendicular post can be left on the generator at all times if desired, and the horizontal bar can be taken off and put on in a few minutes. The device is applicable to all sizes of generators.

The Buffalo Union Depot.

The presidents of all the railroads centering at Buffalo, N. Y., have agreed upon a site and plan for a union depot and terminal station to supersede the four separate depots now in use, providing the city will evacuate certain streets necessary to the use of the site selected, cede for trackage purposes the old Hamburg Canal bed and a section of the Erie Canal bed in the central portion of the city, soon to be abandoned, and further provide suitable wide street approaches and a plaza and mall in front of the union station building. The railroad companies agree to purchase the necessary property for the site of the station and terminal grounds. Public sentiment among the citizens is strongly in favor of acceding to the request of the railway companies and it appears probable the plan will be carried into effect.

The site selected is centrally located and convenient to both business and residential sections—four blocks west of the junction of Main and Niagara streets and about one-half mile north of the district in which the present passenger stations are grouped. It embraces an area of about 1000 x 3000 feet for the station and terminal tracks and extends from Delaware avenue to Carolina street. The station proper will have a frontage of 400 feet on a plaza and mall and facing Niagara Square, where the McKinley Memorial Monument is being erected and where many important streets converge. In the rear of the station building there will be a covered concourse 600 feet long by 100 feet in width, extending over 32 depressed tracks having covered platforms connected with the concourse by stairways. Of these tracks 20 will be connected with a loop at the north end of the station property for the turning of through trains, and 12 tracks will be stub tracks for the use of the roads terminating in Buffalo. Tracks will also lead through the depot for Niagara Falls and International Bridge connections. Upon the terminal property will be located tracks for the storage and cleaning of 1200 sleeping, passenger, baggage, mail and express cars, and round houses for 97 locomotives, also a power house.

In conjunction with the union terminal station the city plans to establish a steamboat station and excursion docks in the rear of the terminal property, which abuts on the Erie Basin and Lake Erie. The excursion docks will be 1200 feet in length and will be connected with the railroad terminal by two large viaducts. The abandoned passenger stations of the different roads will be arranged for freight depots.

The construction of the Union Depot and terminals according to present plans will call for an investment of $10,000,000 on the part of the railroad companies and $3,000,000 by the city. The following roads will participate in the cost of construction and use of the depot: New York Central, Pennsylvania, Erie, Lehigh Valley, Delaware, Lackawanna & Western; Lake Shore & Michigan Southern, Grand Trunk, Michigan Central, New York, Chicago & St. Louis (Nickel Plate); Wabash, Buffalo, Rochester & Pittsburgh; Buffalo & Susquehanna and Pere Marquette.

Charles W. Goodyear, president of the Buffalo & Susquehanna Railroad, is chairman of the Union Depot Commission appointed by the Mayor to take up with the railroad companies the project of a union depot and which brought the matter of site and plan to a successful issue.

The old plant of the Lewis Foundry & Machine Company, on the South Side, Pittsburgh, Pa., which the company abandoned when it built its new works at McKees Rocks, has been sold to the DeNoon Brothers Paint & Glass Company, and will be turned into a large paint works.

The Blake & Johnson Wheel Rim Rolling Machine.

Continuously increasing the weight and power of automobiles has increased the difficulty of manufacturing rims for the wheels, which must be very heavy, strong and also true. A heavy rim rolling machine for doing this work has been brought out by Blake & Johnson, Waterbury, Conn. It is a machine with several interesting mechanical features, and is powerful enough to roll rims of the maximum size in use to-day, and even somewhat larger and heavier, such as will probably soon be required. At present the heaviest rim in use is rolled from stock 5-16 inch thick and 6 inches wide. This machine will roll rims up to ⅜ inch thick and 7 inches wide and of a diameter up to 40 inches.

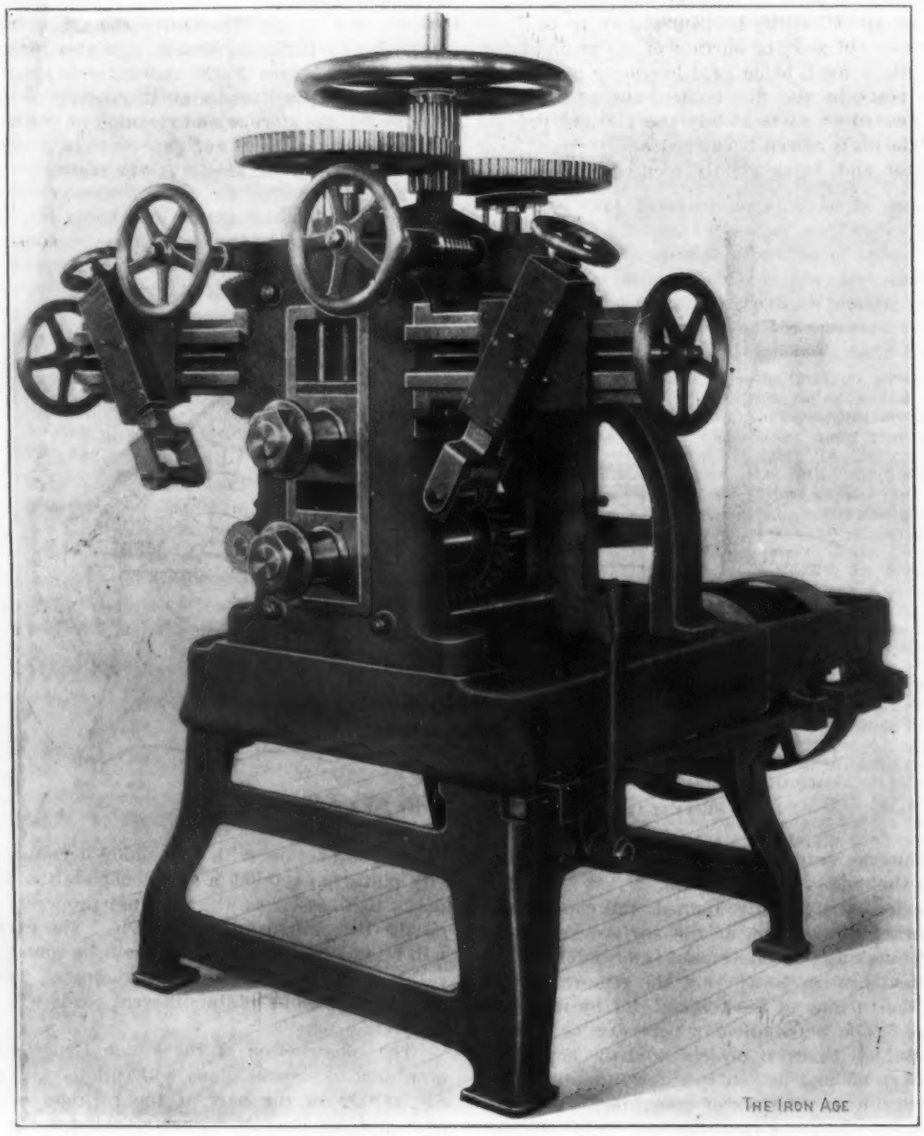


Fig. 1.—Working Side of the Blake & Johnson Automobile Wheel Rim Rolling Machine.

Photographic views of the machine are shown in Figs. 1 and 2, and Fig. 3 shows the end and side elevations. Referring to the latter, the two rolls, A and B, are carried on the two heavy spindles at the front of the machine. Some automobile wheel rims require deep impressions, and for this reason the upper roll spindle of the machine is allowed a considerable vertical movement, 5 inches. The flat stock, cut the length of the circumference of the rim to be made, is fed between the rolls, which are gradually brought together by means of the hand wheel at the top of the machine. The rim is curved by arc forming rolls carried on two arms, which are held at an angle of 45 degrees on the cross heads.

When a number of rims are to be rolled of the same diameter, the arc forming rolls are withdrawn into their heads, and the cross heads are brought to a point that places the arc forming rolls in an approximate position against the stock. This position on the cross head being once obtained, it is not necessary to change it until another diameter of rim is to be rolled. As the rolling continues, and the main forming rolls are brought together the arc forming rolls are gradually fed downward against the stock until the full curvature is completed. It is unnecessary to gauge the feed of the arc forming rolls as the stock is cut to exact length and when the ends meet the correct circle of given diameter is obtained. At the same time the forming rolls have given the desired impression as determined by their shape.

One difficulty which attends the rolling of rims is the tendency of the stock to swerve from the proper plane. This may be due either to uneven hardness of the metal, one side being softer than the other, or to uneven thickness. The tendency to distort must be rectified if the rim is to be perfect. This is effected in this machine by swiveling the cross heads. As may be seen in the illustrations, the cross head rails at the point where they join the main frame of the machine, are provided with segmental worm wheels, which engage with worms revolved by the hand wheels at the front near the top. These wheels are independent of each other, and by adjusting them as soon as there is evidence of distortion in the work, it may be brought back to correct alignment.

It is necessary that the forming rolls, and, therefore, their shafts, be held exactly parallel, while the upper

roll is raised or lowered by the elevating screws at the front and back of the machine. These screws are the same pitch and are revolved at their upper ends by gears of the same size, meshing with a common pinion on the hand wheel at the top, by which the operator raises the upper forming roll to admit the stock and lowers it during the operation. The two shafts carrying the rolls

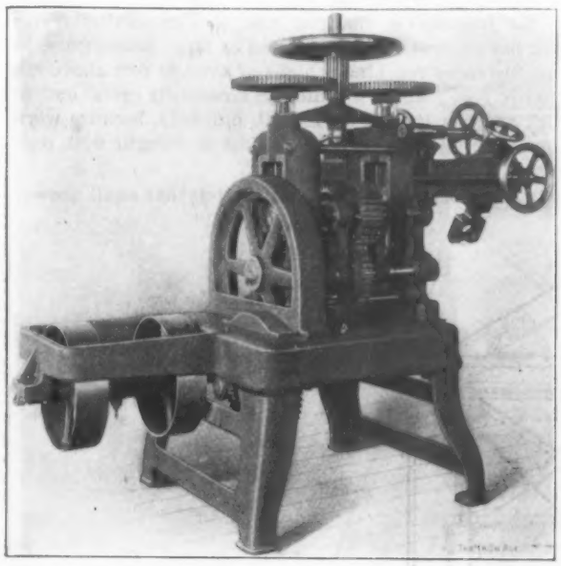


Fig. 2.—Another View of the Machine Shown in Fig. 1.

revolve oppositely, and must also revolve continuously at the same speed, while the upper roll is being raised or lowered. This condition is maintained in a train of gearing connecting the two roll shafts, which may be seen in Fig. 3 and also in Fig. 2. The gear on the lower roll shaft meshes with a gear on a stationary intermediate shaft, which in turn meshes with a third gear engaging the gear on the upper roll shaft. The third gear is mounted on a short shaft carried by links swinging about the intermediate shaft and the upper roll shaft. These links maintain a constant distance between the centers of the gears, so that the raising and lowering of the upper gear with the upper roll does not allow any of the gears to come out of mesh.

In rolling a rim as either end of the stock approaches the rolls the machine is reversed by means of the lever at the right in Fig. 1, which operates friction clutches on the driving shaft. Drive in both directions is provided by the pulleys shown, one being connected to the countershaft by an open belt and the other by a crossed belt.

Western Railroads Abolish Excessive Switching Rebates.

The Western railroads entering Chicago, with the exception of the Wisconsin Central, have agreed, in compliance with the decision of the Interstate Railway Commission, to refuse to extend to the International Harvester Company, the United States Steel Corporation and similar organizations owning and controlling private switching railroads the excessive rebates in the shape of switching charges that have prevailed heretofore. The new maximum charge is given as $3.50 a car, against from $10 to $20 per car, which railroads have been paying, on both in and out freight, to the private switching roads controlled by industrial corporations. This is accounted a victory by the Chicago Shippers' Association and is welcomed also by the Western roads as a release from a form of rebate that proved to be expensive. The corporations interested will throw the largest possible tonnage of freight to the dissenting road.

It is not thought that the matter will end here, as the disposition of the majority of roads is to make use of the machinery and power of the Interstate Commerce Commission to force the abolition of a practice which has been burdensome to them while, incidentally, it has been unjust to the general shipping public. In the past it has been found easy to enforce railroad legislation which has been to the financial interest of the roads as a class as against shippers who were accustomed to demanding or receiving special favors, and it is thought that the present case will not be an exception to that rule.

The Marine Iron Works, Chicago, enjoys the distinction of having equipped 90 per cent of the vessels of medium size built for and used in Amazon River traffic in the last few years. It is a peculiar fact that this firm located 1000 miles from seaboard, finds 75 per cent. of its trade in foreign lands, South and Central America and South Africa particularly. A large business has come to it during the past year, when domestic business was almost at a standstill.

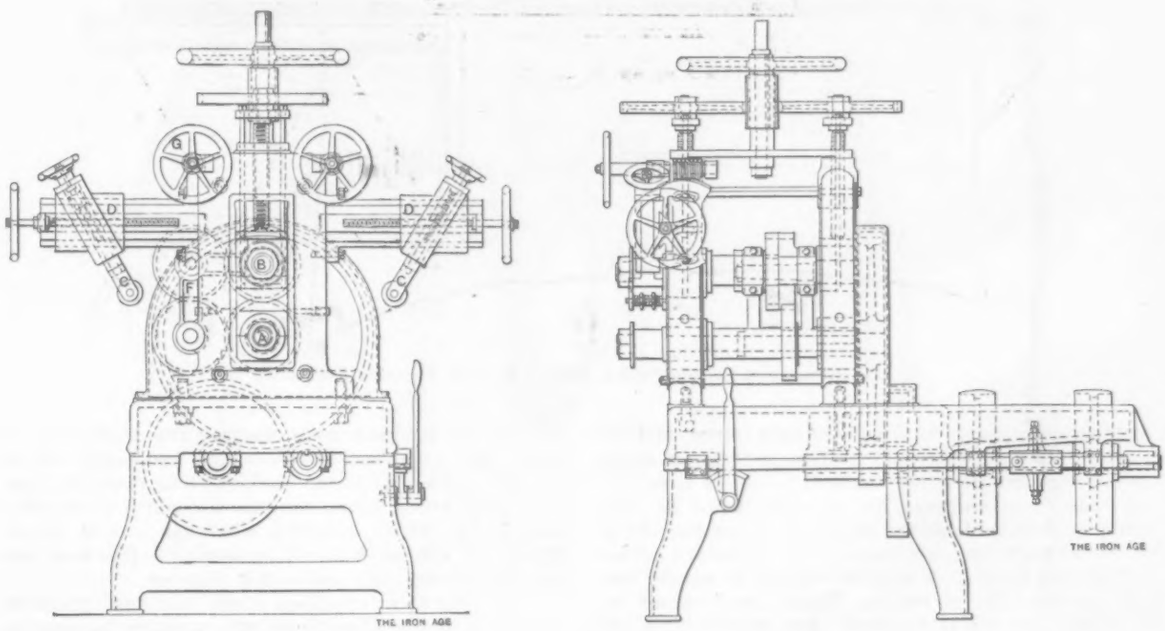


Fig. 3.—End and Side Elevations of the Automobile Wheel Rim Rolling Machine.

A New Blast Furnace Charging Device.

In the development of the modern blast furnace in America the chief aim has been toward larger outputs and lower cost of production. Aside from the great natural resources of this country in ore and fuel the marked increase in production has been largely due to the aid of mechanical transporting appliances for handling the enormous quantities of raw materials required. Costly and elaborate plants have been built for handling the material from steamboats and railroad cars to stock yards and for reloading from stock yards to furnace hoists, and furnaces have been equipped with mechanical chargers, supplanting the old-time top fillers and barrows. But while in the great activity in the building of new plants each new furnace has contained improvements on preceding ones, many features have been copied, and development has in some respects been rather one sided, many advantages have been gained, but there have also been some disadvantages. For example, while the skip hoist was most valuable for rapid and economical charging of the stock into the furnace, the important matter of distributing the stock with its relation to regular furnace working, life of furnace lining, &c., has not received the attention it deserves. And while, by the use of a double bell arrangement in the charging apparatus, much available fuel gas is saved, the dust blown over from the furnace into the downcomers and flues has made additional plant necessary for its removal.

Little has been accomplished in securing simplicity of construction. The charging bell and hopper are still arranged as when introduced by Parry, more than 50 years ago, suspended in the tunnel head of the furnace and below the furnace top platform. This was necessary as long as furnaces were charged by barrows and hand labor. The bell and hopper being exposed to the hot gases in the furnace must be very heavy, and the removing of the bell and hopper when necessary during a furnace campaign is a cumbersome operation, sometimes requiring the shutting down of the furnace for a couple of days. Such shutdowns are always undesirable because of the time lost and the irregularity in furnace working caused thereby.

The machinery on the top of a modern blast furnace for the mechanical charging and the supporting frame work has become complicated and of large proportions, in some instances reaching a hight of over 50 feet above the furnace top. Such machinery frequently gets out of order and repairs are made with difficulty, because work around the top of a furnace in blast is fraught with danger.

In an effort to design a furnace top that shall answer all purposes for mechanical charging and distribution of stock, and at the same time be simple and easily accessible, two engineers—Knute Backlund and Birger F. Burman of Sparrows Point, Md.—have recently developed a new device, which embodies what has proved advantageous in present forms of furnace top apparatus and contains several novel and useful features.

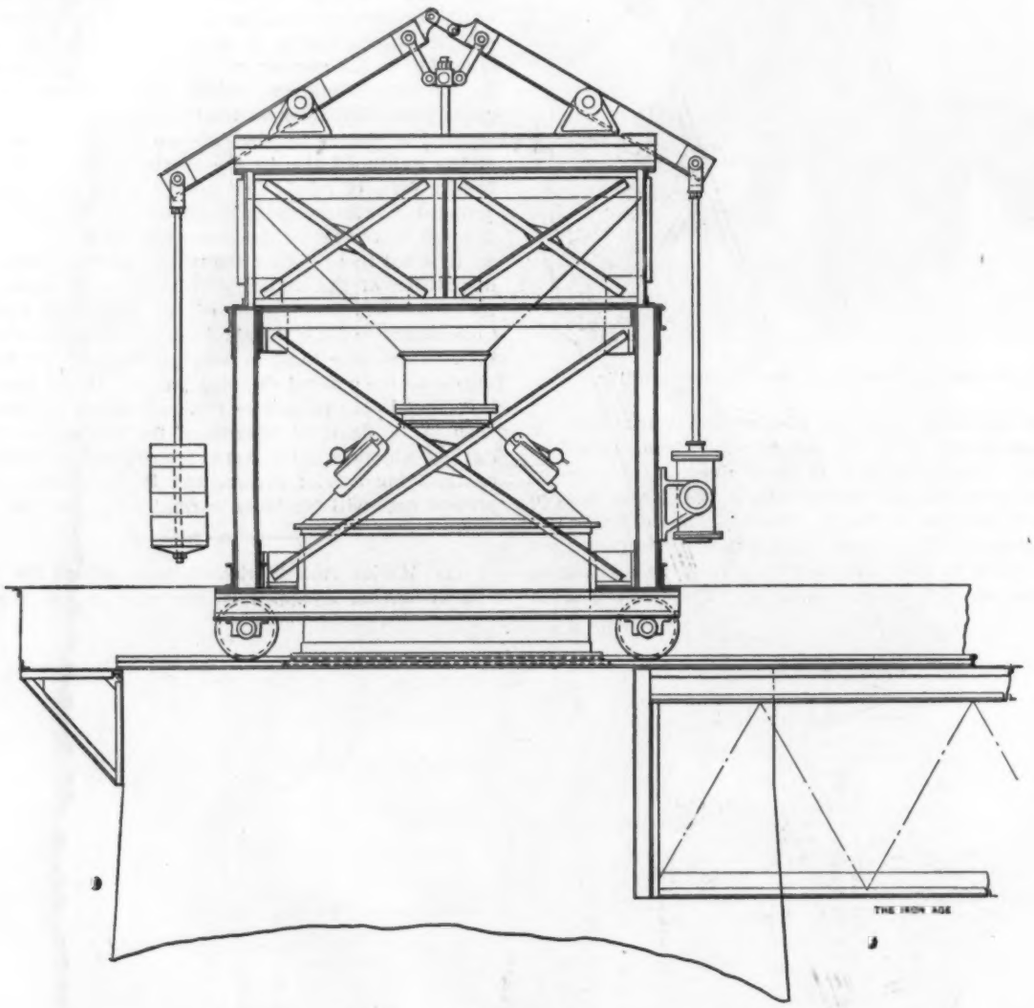


Fig. 1.—Elevation of the Backlund & Burman Furnace Charging Apparatus.

Fig. 1 shows an elevation of the charging apparatus, and Fig. 2 is a sectional view of a complete furnace top with skip hoist. The distinguishing feature of this device is that the bell and hopper are placed outside the tunnel head, a little above the furnace top platform. By this arrangement the furnace may be filled almost to the top and the cubic capacity of the furnace increased, or the hight of the furnace may be reduced without diminishing the capacity. Being removed from the hot gases of the furnace the bell and hopper in this design are more durable and may be made much lighter than usual.

In the illustration the hopper is a steel plate cylinder, with an inner part also of steel plate, in the shape of a

truncated cone. Near the bottom there is a cast steel ring riveted to both the inside and outside shells, which makes the whole rigid and forms a gas tight seat for the bell to bear against. The hopper is bolted to a tunnel head ring, which is secured to floor girders on the furnace shell. On the top of the hopper is the usual form of seal made of steel plate and provided with explosion doors. This seal, with a smaller bell placed below its top, prevents gas escaping when the bell is lowered, and the explosion doors relieve excessive pressure from gas that may accumulate inside the seal and hopper.

Another novel feature is that the steel frame supporting the machinery is mounted on wheels and is movable on a track extending over the furnace top platform and a bridge, one end being secured to the furnace shell and the other on an adjoining stove or a separate structure. On top of the main frame is carried a rectangular hopper for receiving the charge from a double skip hoist. Across the top of the receiving hopper are placed a pair of heavy girders to carry the bell beams. From the adjoining ends of the latter (see Fig. 1), suspended by two sets of links, is a cross head carrying the bell rod of the charging bell, and the outside ends are connected, one to a rod loaded with counterweights and one to the piston rod of an air cylinder. The sides of the receiving hopper are sloping and are joined at the bottom to a distributing cylinder. This cylinder is extended down into the seal on the hopper, and its bottom is closed by the smaller bell—the sealing and distributing bell.

The large bell is suspended from a sleeve which fits

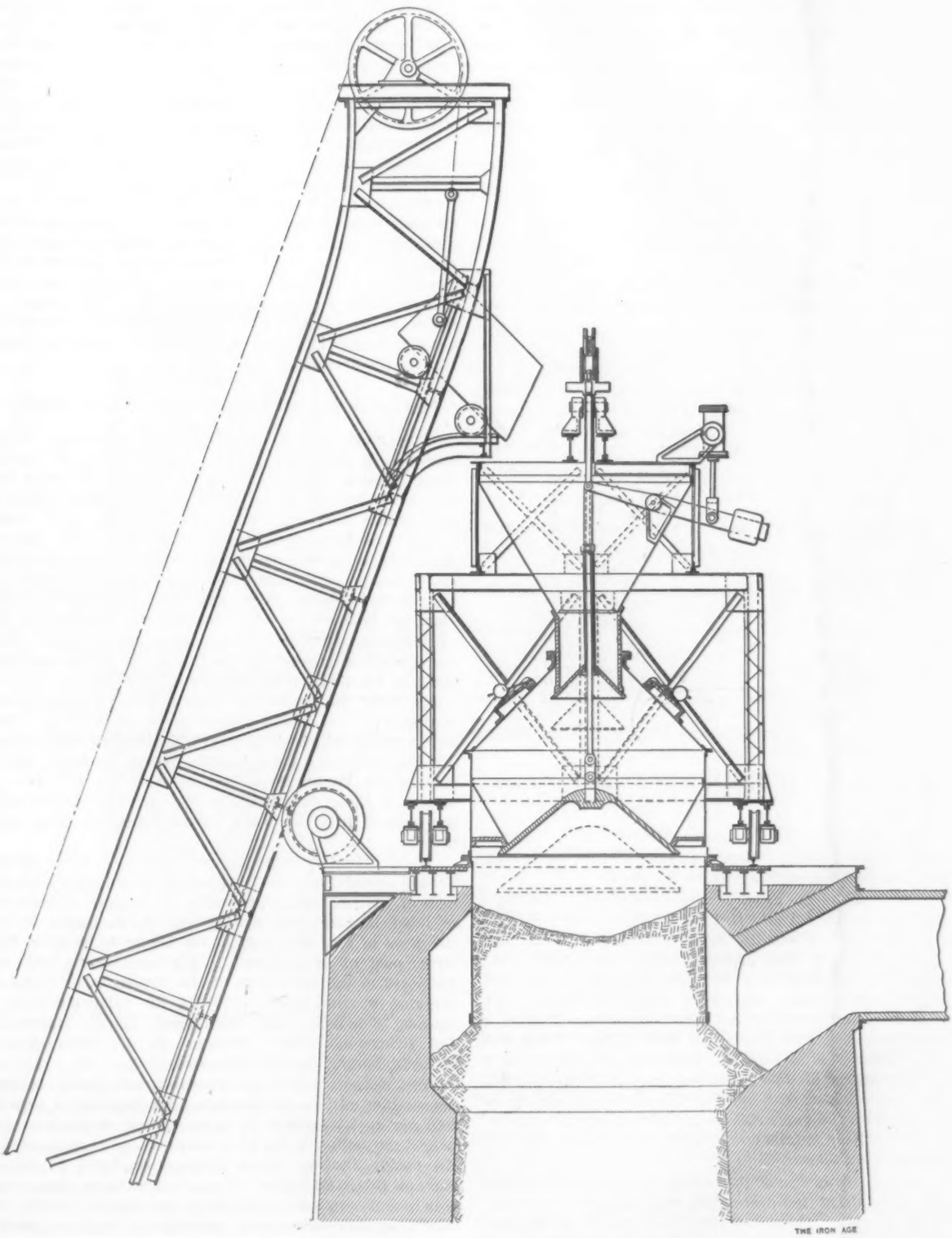


Fig. 2.—Sectional View of a Complete Furnace Top with a Skip Hoist.

freely upon the outside of the rod of the charging bell, and is connected by a pair of links to one end of a lever, Fig. 1. The other end of the lever is weighted and connected to the piston rod of an air cylinder. The top of the conical seal is fitted with a cast iron flange large enough to allow the seal to be freely moved up and down around the distributing cylinder, but this clearance space is normally closed gas tight by packing and a ring made in sections and easily removable. The receiving hopper is firmly braced and secured to the frame, and the whole apparatus presents a symmetrical, pleasing appearance.

The tunnel head ring, which forms the seat for the hopper, carries a cylinder extending down into the furnace. It may be preferable to have two cylinders, one of cast iron and an easily removable inside one of steel plate, but if the furnace is kept filled up to the top the damp and cool stock within the cylinder will protect the latter against the heat of the furnace. Surrounding the cylinder is an annular space open to the downcomers.

The cylinder within the tunnel head serves three purposes: It prevents the destruction of the inwall from falling stock; the dust which is set free when the bell drops is confined within the cylinder and the gas will pass over

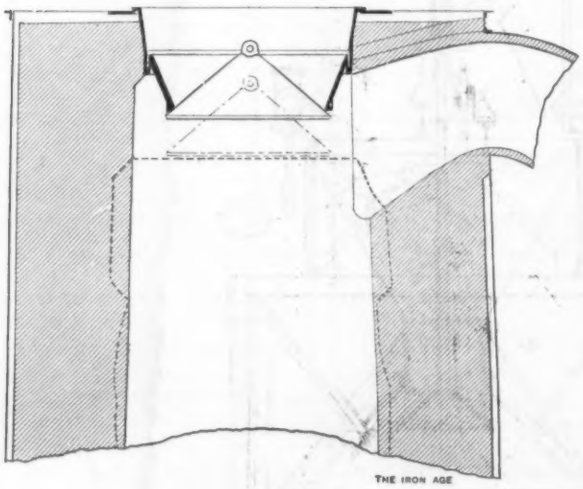


Fig. 3.—The Usual Arrangement of the Bell and Hopper in a Furnace.

into the downcomers without carrying all this dust along, and it assists the distribution of the stock.

Fig. 3 shows the usual arrangement of a bell and hopper in a furnace. The dotted lines indicate how the brick wall has been cut out by the stock falling from the bell against the wall. This probably occurs only a short time after the beginning of a furnace campaign. Cast iron blocks laid between courses of bricks and steel bars placed vertically around the barrel have been used as a protection, but have proved of little value. From the same figure it is also evident that when the bell drops a great quantity of dust is stirred up. In furnaces with open top without seal most of this dust is carried up in the air with the flame and partly burned, but in furnaces with closed top it falls down again and is blown over into the gas downtakes.

In the new device at the bottom of the cylinder within the tunnel head the descending stock spreads itself over a larger area. There are thus three points of distribution: from the distributing bell on the charging bell, from the charging bell into the tunnel head cylinder and from the tunnel head cylinder into the furnace barrel.

Again, referring to Fig. 2, it is seen that the inclined bridge for the skip hoist is independent of the charging machinery and frame work. It is bolted to the foundation below, and at the furnace top each of the three trusses forming the double track bridge rests on one roller of large diameter. This gives the bridge freedom to expand and adjust itself to any variation due to expansion or contraction of the furnace. It has been a common practice to have the bridge rigidly connected to the furnace shell or furnace top frame work, but this has frequently resulted in distortion and torn off rivets.

To change a bell in this device the pipes to the cylinder are disconnected, the hopper is unbolted from the tunnel head ring, and the packing around the distributing cylinder is removed. The bell is raised a few inches by a pair of jacks placed under the bell rod cross head, and carries with it the hopper and seal, which, as before described, are free to move outside the distributing cylinder. The whole apparatus is then pulled out on the bridge, the hopper is blocked up, the bell lowered and disconnected, and the machine moved again to a point where the new bell is placed ready to be attached. With everything in readiness this whole operation should not require more than a couple of hours. It is not necessary to change the bell in a furnace very often, but when this occasion arises it is important to have it done as quickly as possible.

The facility for changing the bell in this device is particularly valuable when it is desired to experiment with different forms or diameters of bells until the most suitable one has been found. Considering the importance of continuous, uninterrupted running of a furnace and that annoying delays are often occasioned by trivial causes, a device that tends to eliminate long shutdowns should be a welcome addition to the improvements in modern blast furnace construction.

National Metal Trades Association Notes.

CINCINNATI, OHIO, December 24, 1904.—The labor situation in the shops of the members of the St. Louis Metal Trades Association is quiet, except in a few instances where efforts are being made by union agitators to organize the employees. Several cases have been brought to the attention of Jesse W. Leigh, secretary, where union men have made it so disagreeable for nonunion men that they were almost tempted to quit their positions. The association immediately took vigorous measures to stop any further molestation of workingmen, whether by union or nonunion men. The four foundries affected by the late strike of the molders are now running with a full quota of men.

The labor bureau of the Boston Metal Trades Association reports a decided improvement in business. The next meeting will be held at the Trade Club Wednesday evening, December 28, at which George H. Ellis, president of the United Typothetæ of America, will give a review of labor conditions in the printing trade and the manner in which their recent difficulties were settled.

H. C. Hunter, secretary of the New York Metal Trades Association, has been named as temporary chairman of the proposed organization of Eastern secretaries of labor bureaus and has invited W. P. Eagan to be the guest of that new body at the dinner to be given the latter part of next month. This organization will be composed of the secretaries of the various labor bureaus operated by the metal trades in the following cities: Boston, Worcester, and Springfield, Mass.; Hartford, and Bridgeport, Conn.; Trenton, N. J.; Philadelphia, and Pittsburgh, Pa., and Syracuse, N. Y.

The weekly bulletin of the Cincinnati Metal Trades Association advises its members that there is an organized movement against its labor bureau on the part of union agitators. Fifty-three members were present at the recent meeting of the foremen employed by members of this association. Ten of the twelve foundries which were originally affected by the molders' strike in Cincinnati are now being successfully conducted with nonunion men.

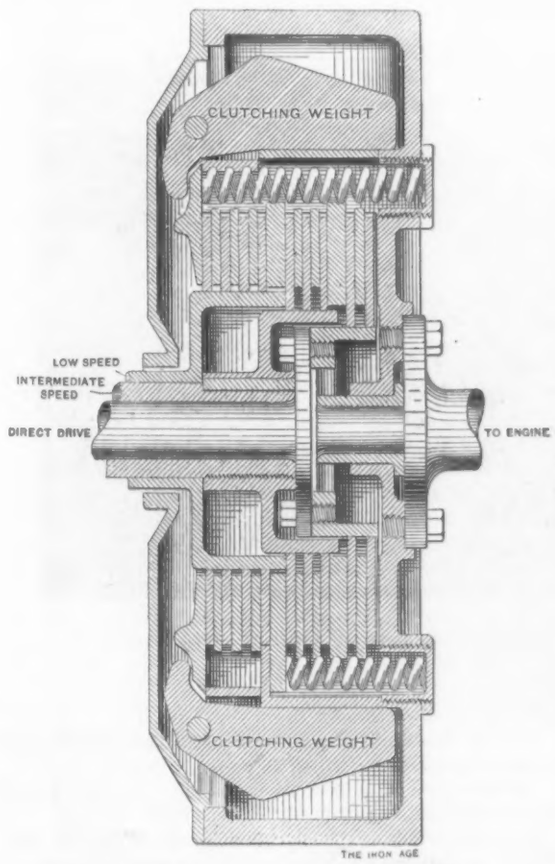
W. P. Eagan, the commissioner of the National Metal Trades Association, advises Secretary Wuest that it is his intention to spend the holidays and the month of January in the East. His efforts in that territory up to the present time have been gratifyingly successful. During his absence Secretary Wuest had added very materially to the association's membership in Cincinnati.

The first issue of the *Open Shop*, in a new and elegant dress, has just made its appearance, and Editor Wuest has ample reason for feeling proud of the magazine which he has so carefully nurtured.

The Sturtevant Clutch.

The automatic clutch shown in the accompanying illustration, while designed primarily for automobiles, will be developed for steam turbine use by the manufacturer, the Sturtevant Mills Company, Harrison square, Boston, Mass. It is believed that the clutch will be of decided advantage to the steam turbine on account of its ability to take on its load gradually instead of instantly. The clutch is contained within a fly wheel mounted upon the engine shaft and is controlled and set in action by centrifugal clutching weights, which cause groups of friction disks to come into gripping contact. There are three of these groups, each provided with a spring, the thrust of which must first be overcome by the weights before the surfaces engage. The action is as follows:

The motor or engine shaft runs idly up to a certain speed, say 300 revolutions per minute, under which the centrifugal force is insufficient to overcome the springs and cause the disks to clutch. At 300 revolutions the



Cross Section of the Sturtevant Clutch.

first clutch becomes operative and imparts power through a sleeve on the driving shaft, marked "low speed" on the drawing, to a corresponding gear in a gear box not shown. At 500 revolutions of the fly wheel per minute the second or intermediate speed clutch is started and imparts additional power to another gear in the gear box through the "intermediate speed" sleeve. At a still higher speed, say 800 revolutions, the third set of disks is thrown in and direct drive is obtained through the shaft. The speeds mentioned are those employed in the adaptation of the clutch to an automobile. They may be varied for steam turbine or other drives.

It will be noted that an overload, such as might be put on an automobile engine when ascending a hill, cannot stop the engine. The engine being crowded slows down, and the clutches are thrown out one after another until the engine speed falls below 300 revolutions, at which the engine shaft ceases to impart power to the driving mechanism. No hand clutch need be employed and the engine runs free of load. Unless the grade is extremely steep it is probable that the engine will be able to furnish the required power on either the intermediate speed or the low speed, so that the automobile will continue to move at a speed in proportion to the power required. A strictly automatic change of speed and power is thus obtained.

Each of the three sets of clutches consists of a number of thin cast iron disks of large diameter, the alternate ones being fast on the drums of the driving shaft and the two sleeves, previously mentioned, and the intermediate ones dovetailed to parts connected with the fly wheel casing. The peripheral weights move outward by centrifugal force like the weights of a governor, but their action is the reverse, for the greater the speed of the fly wheel the greater the speed which the weights cause the engine to impart to the driving mechanism through the medium of the clutches. Each of the clutches operates gears of the usual type in the gear box of an automobile. For steam turbines they will operate gears arranged on some similar principle. Within the gear box ratchets of a form such as is used in bicycles permit the lower speeds to overrun while the higher speeds are in action, but while overrunning they do no work.

The springs which bear indirectly against the fingers of the clutching weights may be adjusted to a greater or less tension. The thin plate clutch is not a new mechanical construction and has been found to be one of the most powerful of clutches, for each additional disk multiplies the power, and as many disks as desired may be used. The hollow fly wheel is oil tight, forming an oil bath for the clutches, so that the wear is claimed to be practically inappreciable.

Chicago Metal Trades Superintendents and Foremen Organize.

Efforts of the Chicago Metal Trades Association in that direction have culminated in the successful organization of the Metal Trades Superintendents' and Foremen's Club, which was mentioned in *The Iron Age* of December 1. The following officers were elected: President, C. E. Davis, superintendent, Goodman Mfg. Company; vice-president, L. I. Yeomans, assistant superintendent, Link Belt Machinery Company; treasurer, Chas. E. Finkl, superintendent, A. Finkl & Sons Company; secretary, *ex-officio*, Paul Blatchford, secretary of the Chicago Metal Trades Association. Executive Committee: J. D. Wiggins, foreman, Link Belt Machinery Company; Chas. Smoler, foreman, Weir & Craig Mfg. Company; Chas. Slater, foreman, Chas. F. Elmes Engineering Works; H. A. Wainwright, assistant superintendent, Sullivan Machinery Company. The organization was perfected at a meeting held December 16 at the Sherman House, and 50 charter members were present. It is expected that before 90 days the membership will approximate 150 superintendents and foremen of shops in the metal trades in Chicago.

While the club will be of the greatest assistance to the Metal Trades Association in dealing with labor controversies, should any arise, its most valuable influence is expected to be along educational lines, as the meetings will be devoted to the discussion of shop methods, machinery and trade conditions generally. Papers on practical subjects will be presented at each meeting by members as well as by experts of national reputation, and these will be printed in pamphlet form and distributed to members. The club will meet the second Saturday of each month. This experiment is being watched with interest by metal trades associations in other cities, and as soon as its success is assured similar organizations will be effected in a number of important metal trade centers. This will lead naturally to a national federation of superintendents and foremen, the beneficial influence of which will be hard to estimate.

The Block-Pollak Iron Company, whose headquarters are in the Marquette Building, Chicago, has established a branch office at 1610 Chemical Building, St. Louis, in charge of Louis S. Simon. This company is prominent in the Western trade in old material.

The Crescent Forging Company.

The Crescent Forging Company has been organized at Pittsburgh, with a capital of $50,000, and will erect a plant at Oakmont, near that city, for the manufacture of drop forgings, general forgings and crank shafts. The forging shop will be a steel building, 65 x 150 feet, equipped with up to date machinery, while the machine shop will also be a steel building, 60 x 100 feet. The company will erect its own power plant, using electricity for motive power, all tools to be run by individual motors. The boilers will be fed by automatic stokers, and a complete coal handling plant will be built.

The site for the plant contains about 7 acres, and direct switching connections will be had with the Buffalo and Allegheny division of the Pennsylvania Railroad. Work has been in progress for some time on the plans, which are almost completed. Proposals for the erection of the buildings and for furnishing the equipment will be asked for by the company in a short time. Work on the buildings will start very early in the new year. The company also contemplates the manufacture of fine tool steel, as some of the incorporators were previously identified with that line of the steel business. Reuben Miller, Jr., formerly of the Crescent Steel Company and later of the Crucible Steel Company of America, will be president of the new undertaking, and D. W. Dunlevy will be vice-president and general manager.

Drawback Allowances.

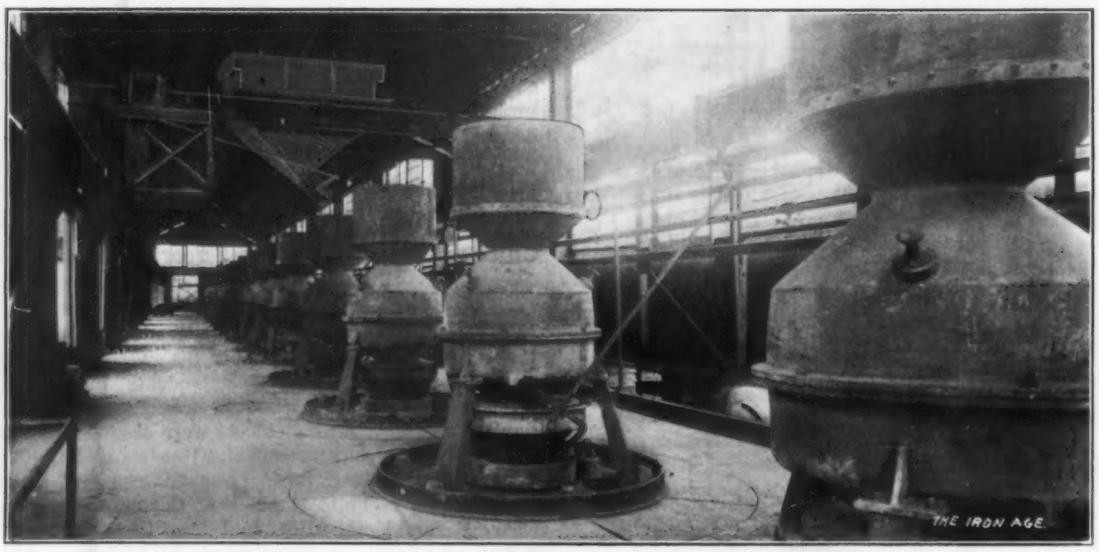
The Treasury Department on December 24 announced the allowance of the usual drawback of the duty paid on imported lead and antimony in combination with tin, used in the manufacture of linotype, stereotype, electrotype and monotype metals by the National Lead Company. In liquidation, the quantities of lead and antimony which may be taken as the basis for the allowance of drawback may equal the quantities declared in the drawback entry, after official verification of exported quantities, provided that the percentages of either imported lead or antimony shall not exceed that shown in the formulas appearing in the manufacturers' sworn statement.

The Department on the same date also announced the allowance of the usual drawback of the duty paid on imported resistance boxes used in the manufacture of electric switchboards by the Western Electric Company, Chicago.

A movement is on foot in Milwaukee, Wis., to establish a trade school. The Merchants' and Manufacturers' Association has the matter in hand, and has appointed committees to make a thorough canvass for the necessary funds, map out courses of study and secure instructors. A. J. Lindemann of the A. J. Lindemann & Hoverson Company is one of the active promoters of the undertaking.

A Model Gas Producer Plant.

The Lackawanna Steel Company has recently installed at its works at Buffalo, N. Y., one of the most complete gas producer plants ever built. The plant is capable of gasifying 175 tons of bituminous coal per day, and consists of 16 Morgan continuous gas producers, provided with the George automatic coal feeder. The complete and efficient method of mechanically handling and distributing the coal to the producers and removing the ashes therefrom, which has been worked out by J. R. George, is believed to be a great improvement over any plan heretofore employed. The usual arrangement of fixed overhead coal bins from which coal is drawn through spouts to each producer presents the following objectionable features:



The Charging Floor, Showing the George Feeding Mechanism and Coal Charging Crane.

A MODEL GAS PRODUCER PLANT.

1. Coal at any given part of the bins can only be used in the producer over which it rests.

2. The cost of construction of the bins distributed over a large battery of producers is high.

3. Considerable expensive machinery must be employed to distribute the coal over the entire battery of producers, and unless this machinery is in duplicate there is risk of the coal supply running short.

4. Daily records of coal used cannot be kept nor can the amount charged to individual producers be ascertained.

All of these objectionable features have been avoided in the plant under consideration.

The accompanying illustrations represent quite fully the entire equipment, which may be described as follows:

The coal is received in hopper bottom dump cars alongside and near the center of the plant. Underneath the railroad track a large steel hopper is provided to receive the coal as it discharges from the cars and deliver it to the boot of a coal elevator. The coal is elevated by means of a simple bucket elevator running vertically only and designed to discharge the coal into a central overhead bin having a capacity of 340 tons. The entire coal supply is carried in this one bin and is distributed to the producers as required by a light traveling car running under the central storage bin and over all the producers.

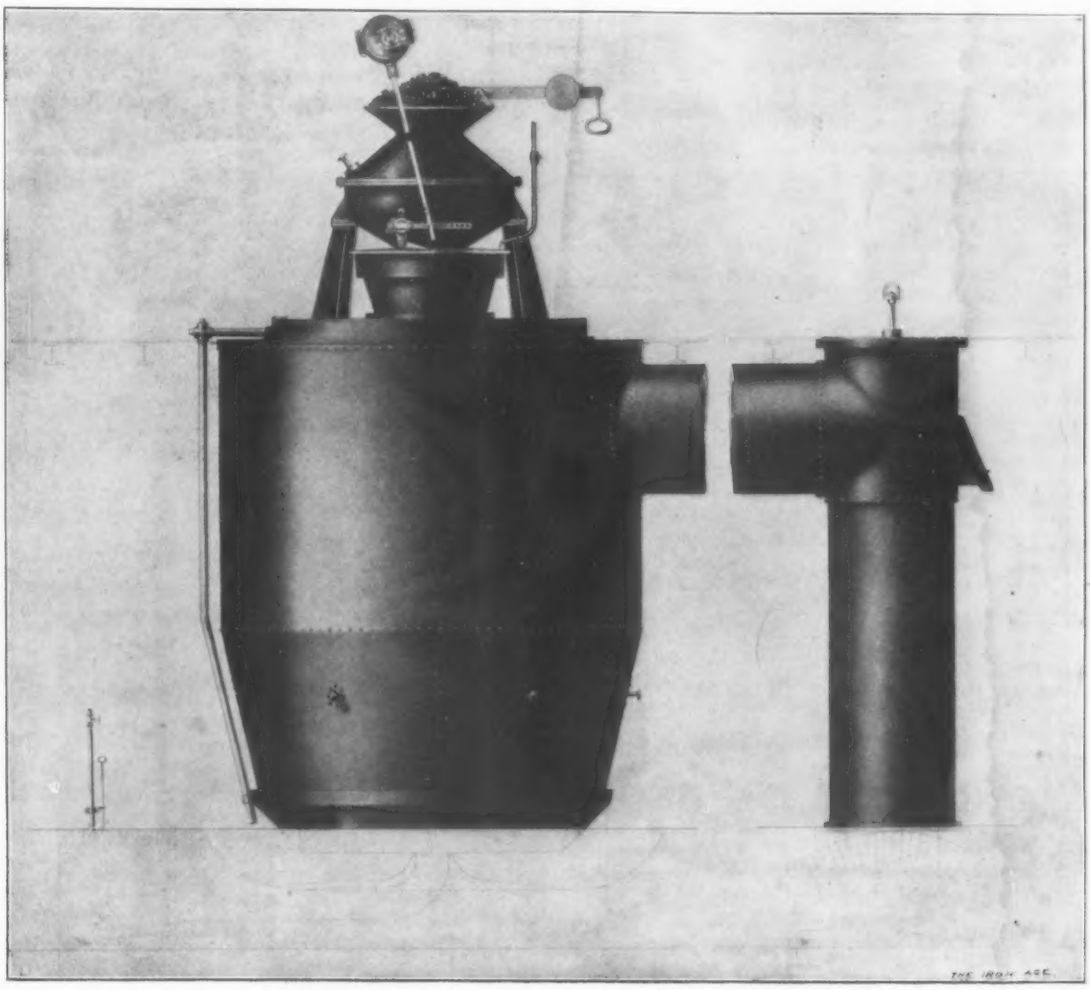
The distributing car or crane, designed by Mr. George, carries a fixed hopper of 5 tons capacity, resting on scales. A boy operator, sitting in the cage of the crane draws, fills the crane tank from the central storage bin and dis-

charges the coal as needed into the receiving hopper of producer in lots of 1000 pounds or less. The crane tank carries 10,000 pounds. The beam of the scale is conveniently located in front of the crane cage and exact coal records are readily made for each producer.

The arrangement of large coal tank and distributing crane makes it possible to utilize the last pound of coal in any producer of a large battery and any additional gas units can be served without adding to the coal handling machinery, as one crane would be capable of serving about 100 producers.

Over the same track on which the coal is received, and within a few feet of where the coal is dumped from the cars, a large ash reservoir is located, with a capacity of 2000 cubic feet. The ashes, which are collected by hand from the bottom of the producer, are deposited in a skip bucket, in which they are elevated to the overhead bin. The ashes are taken away in the same cars in which the coal is brought to the plant, thus saving a switch for each car of ashes removed.

The entire equipment was built by Morgan Construction Company, Worcester, Mass., from its own designs.



Elevation of the George Automatic Feeder on the Morgan Continuous Gas Producer.

A MODEL GAS PRODUCER PLANT.

The city of Harrisburg, Pa., has advertised intention to apply to the State Legislature for permission to build a dam in the Susquehanna at the lower end of the city to improve its sanitary condition by creating a higher level of water along Harrisburg's three miles of water front. The proposed dam would be four or five feet high. The Board of Public Works will have charge of the matter and will ask for bids, if the work is authorized by the Commonwealth.

Notes from Great Britain.

The Midland Wages Board.

LONDON, December 17, 1904.—A general meeting of the members of the Midland Iron and Steel Wages Board was held in Birmingham this week. There were a number of employers present and the workmen were also well represented. The chairman pointed out the good work done in the past by the Wages and Conciliation Board and urged the necessity and desirability of keeping it alive. He stated that the employers had ascertained that 34 works in South Staffordshire, 3 in Shropshire and 6 in South Wales were willing the board should continue in existence. On the other hand 27 firms took the opposite view, but their works were very small compared with those who wished to remain connected with the board. In addition to the 34 in South Staffordshire there were several firms who had not answered the printed question, but were really in favor of the board, although they had merely given a verbal consent. He felt sure that they would join, but the matter before the meeting concerned the 43 firms who had given their written consent to remain members of the board.

The chairman proposed "That, having had the results of the recent canvass of employers and operatives in South Staffordshire, Shropshire and South Wales placed before us, and recognizing the desirability of maintaining the Midland Wages Board, not only in the interests of the iron and steel trades affected, but in support of the reasonable principles of conciliation and arbitration, we pledge ourselves to become subscribing members of the board and conform to and observe the rules and decisions thereof." The resolution was sec-

onded by the chairman of the operatives section and was carried unanimously.

An interesting point with regard to the sliding scale was raised by the operatives' secretary during the discussion. He said that it would be necessary to widen the basis of the board and that the new sliding scale must be established on a basis which would truly represent the trade. This was not an easy matter, but it had been done in Scotland and the north of England where the works were fewer. The new basis would depend upon the number of works that made a fair class of iron and were representative of the whole district. The basis must be arranged on righteous lines and both sides must be safeguarded. The question was one of bread and butter—how they were to feed their wives and families; they were going to contend for a fair wage, and the men who would not give fair work in return for it should be cleared out of the trade.

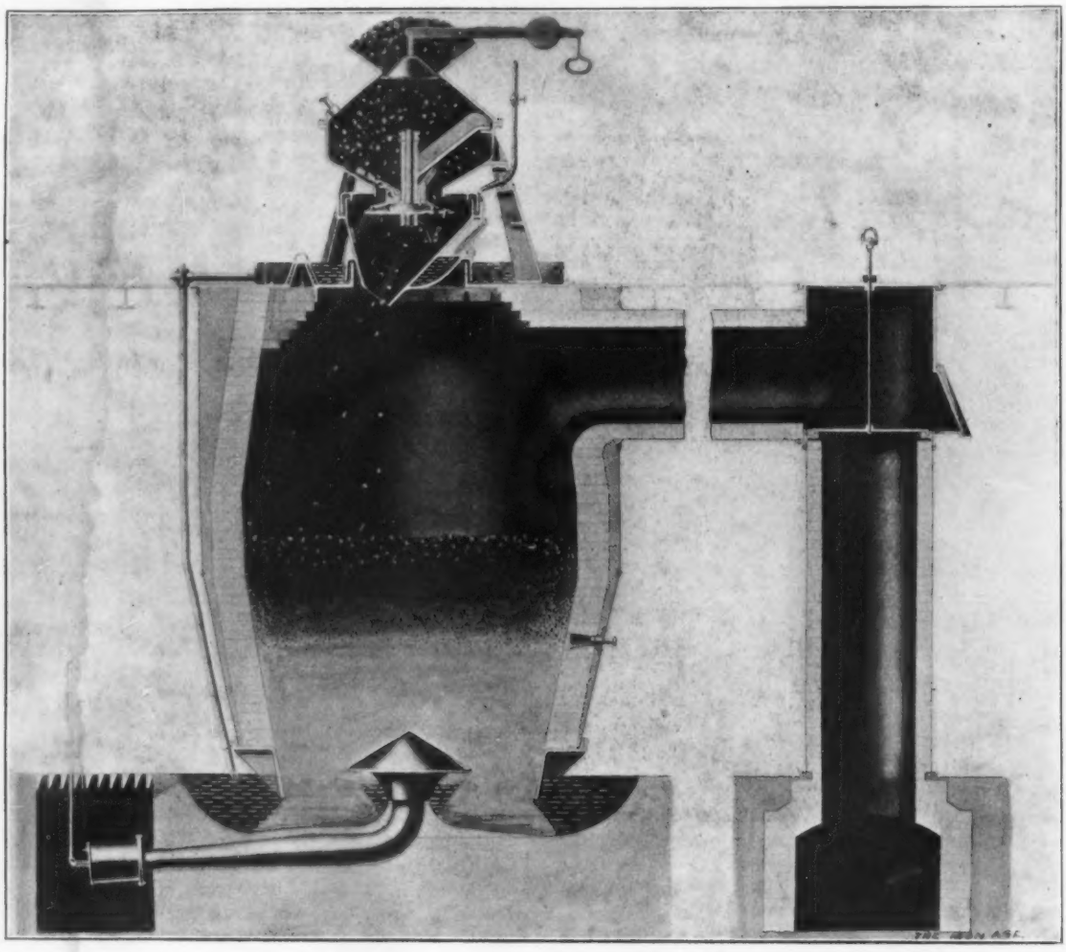
The results of this conciliatory meeting are satisfactory so far as they go, but the iron trade is by no means "out of the woods" yet. The exceedingly difficult question of the modification of the sliding scale will find the members of the standing committee occupation for some time to come. It is, however, satisfactory to know that the wages board has gone through the ordeal without any loss of strength. It was feared that the recent crisis might be regarded as an opportunity to secede, but the result of the inqury has been to assure for the board at least the continuance of the support enjoyed in the past. The board has maintained peace for so long that there is a danger of forgetting the extent of the evils which would otherwise exist. With no authoritative tribunal to regulate wages, every employer would be left free to make the best terms he could for himself, and in a very short time attempts would be made to cut down these to the lowest possible limit. Already some of the firms outside the board's membership are pursuing this policy, and a break-up of the board would mean that this would become general. It is far better, then, to keep the wages board and to endeavor to strengthen it; and as long as there is one, it is not in accordance with what President Roosevelt has called a "square deal" that there should be 27 manufacturers outside its membership. Apart from any other consideration, common honesty demands that they should fall into line.

The Iron and Steel Trades in November.

As we are nearing the end of the year, it may be interesting to set out, in the various trade centers, the actual condition of the iron and steel works. During November there were 73,505 persons employed at 194 works who make returns to the Labor Department of the Board of Trade. This shows a reduction of 300 as compared with October, and of 1132 a year ago. The total number of shifts worked by all employees was approximately 395,940 in the last week of November, compared with 396,720 in the corresponding week of October, and 398,090 a year ago. The following are the local conditions:

Tyne and Wear.—Employment with steel smelters was reported as fair at Consett; depressed and worse than in October at Newburn and Yarrow. Steel plate and small bar mills generally worked full time; big bar mills nine out of a possible eleven shifts. Cogging and sheet mills at Jarrow averaged eight and nine shifts per week. Forge and hammermen on the Tyne reported employment as fair; on the Wear as moderate. Finished iron and steel workers at Wolsingham were moderately busy.

Tees and Hartlepool.—Employment at iron and steel works at Hartlepool was reported brisk; in October it was fair, a year ago good. Metal expansion works were fairly well employed, but not so well as either a month or a year ago. Workers at



Sectional Elevation of the George Automatic Feeder on the Morgan Continuous Gas Producer.

A MODEL GAS PRODUCER PLANT.

rail mills and other iron and steel workers in the district continued in moderate employment, some improvement being reported in certain directions. Employment was fair in pipe foundries.

South Yorkshire and Lincolnshire.—Employment continued slack for steel workers, and in some branches was reported bad, but on the whole showed a slight improvement over October. Steel workers at Parkgate reported employment fair; at Rotherham and Iccles improved. At Scunthorpe employment was reported fair. Iron workers at Parkgate were slack, at Rotherham and Masbro' fairly well employed.

Midlands.—Employment in South Staffordshire showed some improvement as compared with October. Steel smelters in North Staffordshire were working full time. In Shropshire iron workers were only partially employed, and in Derbyshire about half-time only was worked.

South Wales.—Employment with steel smelters was reported good.

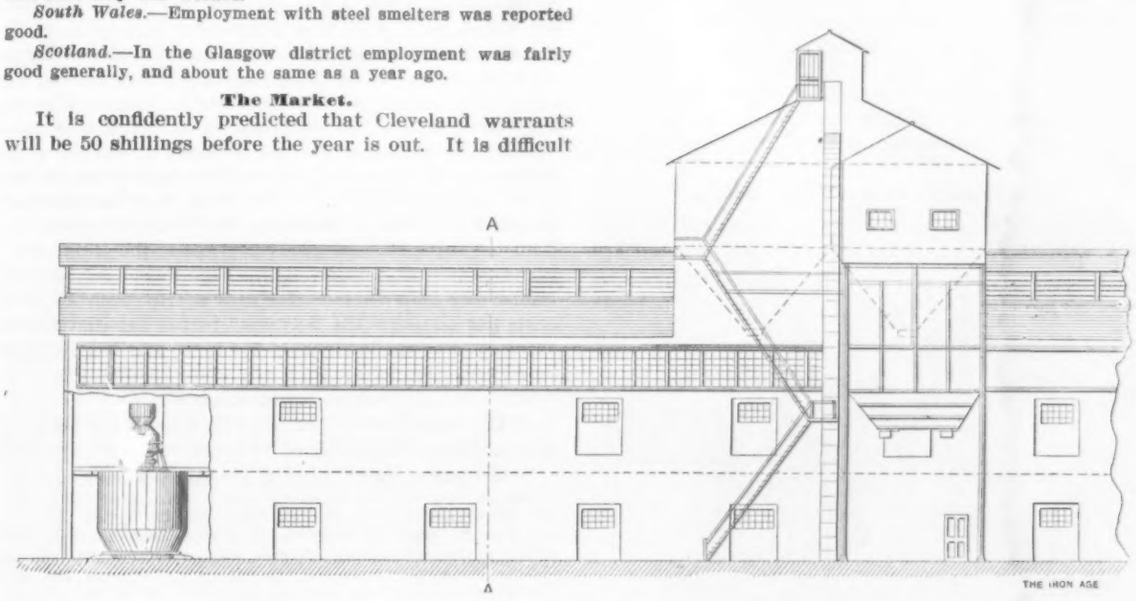
Scotland.—In the Glasgow district employment was fairly good generally, and about the same as a year ago.

The Market.

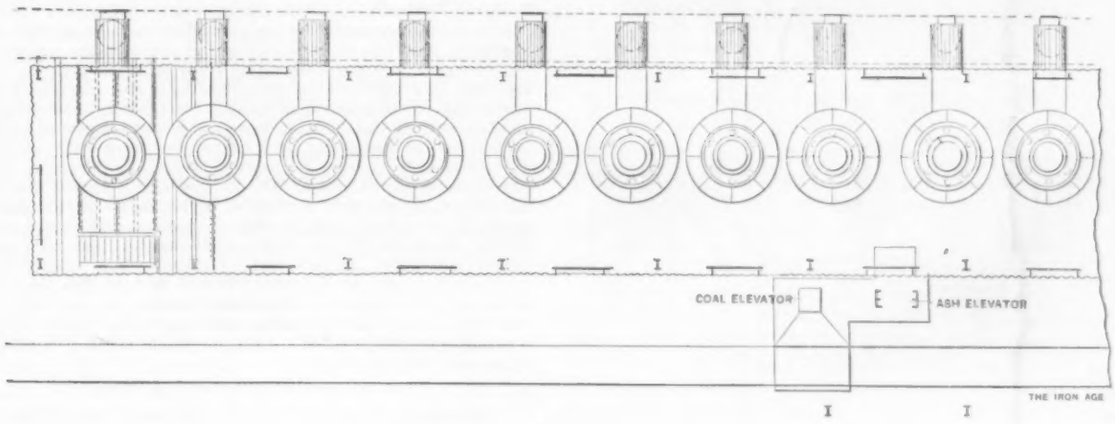
It is confidently predicted that Cleveland warrants will be 50 shillings before the year is out. It is difficult to ascribe any special reason for this, except that throughout the market there is a return of confidence which is remarkable. Indeed, some are so busy that they expect Christmas this year to be not dissimilar from the boom year of 1900. Yet, notwithstanding this confidence, there is a decline in specifying, and, of course, next week this will be more marked. Against this decline, however, must be set the fact that January deliveries are practically all sold. There is no particular advance in prices to indicate this returning confidence, but unmarked bars have gone up about 2 shillings 6 pence. There is considerable activity in black sheets for galvanizing and there is good inquiry for next year's delivery at present prices. Galvanizing material is firm, and the price for hoops is slightly advancing. There is still an absence of foreign competition in steel, and £4 7s. 6d. can be obtained for forward contracts for Bessemer steel bars. I expect in a week or two the price will have gone up to £4 10s.

S. G. H.

The General Electric Company's Curtis steam turbine installation, which was awarded the Grand Prize at the Louisiana Purchase Exposition, consisted of a 2000 kw., alternating current, 6600-volt, 3-phase generator, direct connected to a Curtis steam turbine having its condenser in base and operating on a 175-pound steam pressure. This unit was in regular service after its installation until the close of the Exposition, operating the Cascade pumps and in the evening furnishing power to the St. Louis Transit Company. Frequently the Exposition Company called upon it for emergency service, in which cases a few minutes were required to put it into service. Several times this unit was operating at a heavy overload within 20 minutes after notice was received, the engine having been started up through cold steam pipes in that period of time.



Side Elevation.



Plan.

A MODEL GAS PRODUCER PLANT.

A force of men is engaged in sinking a shaft for copper in the South Mountain, near the historic battle field of Gettysburg, Pa. The Eagle Metallic Company of New Jersey is doing the work, and it is estimated that copper will be struck at 500 feet. The test is being watched with much interest.

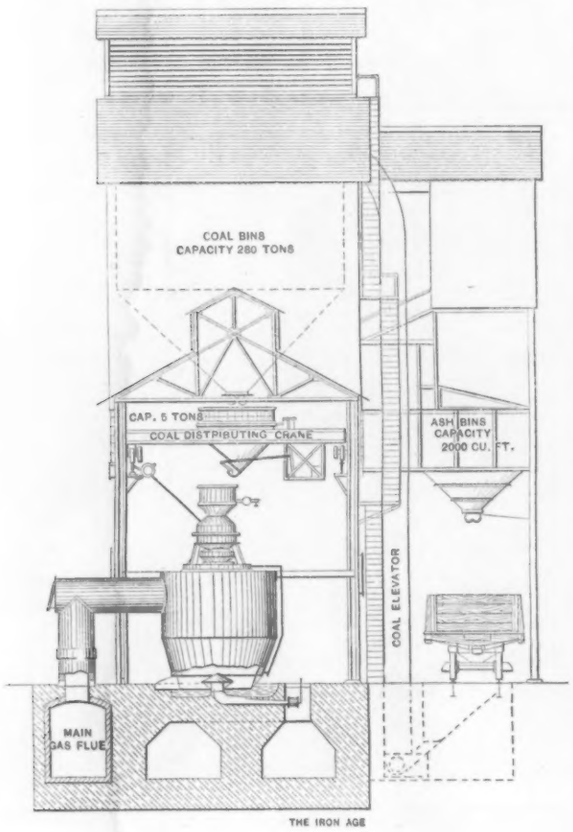
The Philippine Tariff Revision.

To Be Enacted by Congress After Recess.

WASHINGTON, D. C., December 27, 1904.—After an extended conference between the Secretary of War and the leading members of the Ways and Means and Finance committees it has been decided to send to Congress on January 3 the projected revision of the Philippine tariff, the metal schedule of which was recently published in full in these columns. A bill will be drafted enacting the revised tariff as a substitute for the existing law which took effect March 8, 1902. The Ways and Means Committee will report the bill promptly, and a special order will be granted by the Committee on Rules limiting debate and fixing a time for a vote. It is probable that the order will also cut off amendments, as it is the purpose of the House leaders to pass the revision in the exact form in which it has been approved by the Secretary of War.

Few Changes in Published Draft.

The schedules as they will be transmitted to Congress show very few changes from the tariff as published



Cross Section of Model Gas Producer Plant.

seven weeks ago. The metal schedule as printed in *The Iron Age* of November 10 has been approved without change and will probably be adopted by Congress without amendment of any kind. The draft of the proposed revision when transmitted to Congress will be accompanied by a memorandum in which some of the most important modifications of the existing tariff will be briefly discussed and the reasons therefor presented. With regard to the paragraphs covering cast iron, wrought iron and steel in ingots, bars, rails, plates, sheets, &c., this memorandum states that the principal changes made are in the way of classification to make them more definite, and that the rates are those of the existing law. There is an increase in the tariff on wire gauze from $1.75 per hundred kilos to $3 for that containing up to 40 threads per square inch, and from $4 to $5 per hundred kilos for gauze containing 40 or more threads per square inch. (A kilo is 2.2 pounds.) Very large quantities of gauze are imported into the islands, and the change is for the purpose of securing additional revenue.

The Secretary of War calls attention to the recommendation that wrought iron and steel tools and implements for use in the arts, trades and professions be made dutiable at 20 per cent. ad valorem. Under the present specific rate the average ad valorem duty collected is 49 per cent. on fine tools and 21 per cent. on common tools. This change to an ad valorem basis, it is believed, will encourage trade in this class of merchandise. It is also believed that imports of bronze, gilt or nickel articles of copper and alloys of that metal will be largely increased by the proposed reduction from 50 to 30 cents per kilo. Manufactures of nickel, aluminum and other alloys are at present provided for at the rate of 10 cents per kilo, but the Secretary of War points out that in many instances this is equivalent to not more than 2 per centum ad valorem, a much smaller rate than it is believed this class of goods could pay. It is recommended that the duty on aluminum be increased to $1 per kilo, and on nickel to 50 cents per kilo, which would amount to about 20 per centum ad valorem in the first and 10 per centum in the second instance. While these proposed rates represent large relative increases they are still much less than the same class of goods pay under the Dingley tariff. In equalizing duties it has been found advisable to reduce the rate on manufactures of tin from 50 to 30 cents per kilo, and the Secretary points out that the existing rate is unquestionably too high and that the proposed reduction will greatly stimulate imports.

Duties on Machinery.

With regard to the proposed changes in the duties on apparatus and machinery of all kinds the Secretary says:

Under the proposed revision the duty on machinery and apparatus is placed on an ad valorem basis, this schedule showing more sweeping departures from specific duties than any other in the proposed revision. There has been much criticism of the present machinery schedule, on the ground that the provisions for specific rates fail to equitably distribute the taxes levied thereunder. On weighing machines an ad valorem rate of 20 per cent. is proposed; on marine engines, 10 per cent.; stationary engines, pumps, hydraulic, steam, petroleum, gasoline and hot or compressed air motors, 15 per cent., and on steam boilers, 15 per cent.

The paragraph which includes agricultural, pile driving, dredging, hoisting, road building, refrigerating, ice making, sugar mill and machinery for preparing rice, hemp and other vegetable products of the islands for the markets provides a uniform rate of 5 per cent. ad valorem on these articles. This low rate has been placed on agricultural and machinery of a similar nature in order that its importation may be encouraged.

The ad valorem rate proposed for locomotives and parts, turntables and power and hand cranes, is 15 per cent.; electrical apparatus and appliances, storage batteries, dynamos, generators, incandescent lamps, &c., 20 per cent.; sewing machines and parts, 15 per cent.; bicycles, velocipedes, typewriters and parts, 25 per cent.; phonographs, cinematographs, biographs and similar machines, 30 per cent.; cash registers and adding machines and parts, 25 per cent.; automatic slot machines and parts, 30 per cent. ad valorem. It will be seen that the ad valorem rate on machinery in no case exceeds 25 per cent., with the exception of phonographs, slot machines, cinematographs and other machines of this class, on which an ad valorem rate of 30 per cent. is placed.

Congress to Make All Tariffs.

Highly significant action was taken in the Senate just before the holiday recess upon a proposition put forward by Senator McComas of Maryland to clothe the Philippine Commission with power to revise the tariff of the islands in its own discretion at any time. The issue was promptly recognized as having a very broad bearing upon the policy of Congress with reference to the tariffs of all our insular dependencies, and the action taken shows clearly that Congress does not intend to surrender any of its tariff making prerogatives. Senator McComas' amendment to the pending Philippine Government bill was sharply antagonized by Senator Lodge, who said that it would be a very dangerous experiment and one of doubtful constitutionality for Congress to delegate to the Philippine Commission or any other body the power to make a tariff for the archipelago. The proposition, he said, was one affecting not only the revenues and the condition of the Philippine Islands, but the commercial relations of the United States and of all foreign nations to the business of the islands. Under the "open door" policy, which he thought it most important to maintain, the products of all nations entered the Philippines at the same rates, but he pointed out that schedules could

easily be arranged so that by classification and otherwise their provisions would be more favorable to one country than to another. Some of the rates already adopted by the Philippine Commission were very unfavorable to the United States. Under the circumstances, while the "open door" should be maintained, no arrangement should be authorized that would make it possible to adjust the tariff so as to discriminate against American manufacturers and exporters. The importing business in the Philippines, Senator Lodge said, was carried on almost exclusively by foreign houses, which naturally desire to make their importations from countries other than the United States. The representatives of these houses living in Manila would constitute the people whose voices would be heard by the Philippine Commission concerning any desired changes in the tariff. On the other hand, the Commission was far removed from the United States and from the people who are familiar with our industries, and especially our manufactures. Under the circumstances he thought that no such radical change as that proposed by Senator McComas' amendment should be made.

Subsequently Senator McComas modified his amendment by adding a proviso to the effect that "any amendment or modification of the existing tariff made herein shall not take effect until it shall be transmitted by the Commission, or any subsequent Philippine Legislature, to the Secretary of War, who shall, after due advertisement, grant hearings to any person interested in respect to the proposed amendment or modification, and until it shall have been thereafter approved by the Secretary of War by authority of the President."

The McComas Amendment Defeated.

Senator Lodge said he thought the modified amendment less objectionable than when originally offered, but Senator Platt of Connecticut attacked it vigorously on the ground that Congress could not delegate its constitutional power to enact a tariff for any part of its domains. If this could be done in the case of the Philippines, he said, the Legislature of Hawaii, or of Porto Rico, or the courts of Alaska, where there is no Legislature, might be clothed with authority to make local tariffs, and thus the constitutional provisions concerning the subject would be completely nullified. He believed it would always be the policy of the United States to retain the tariff making power in Congress and that the prosperity of the country, as a whole would depend upon such a policy. When the vote was finally taken on Senator McComas' amendment it was overwhelmingly defeated. As already stated, the proposed revision will now be sent to Congress for enactment in due course. The Administration hopes that action will be taken in time to make the new schedules operative on or about April 1. W. L. C.

The World's Water Power Electric Installations.—In a paper on "Electricity from Water Power," presented to the British Association for the Advancement of Science, A. A. Campbell Swinton gave the following interesting table of the total water power electrical installations of which he has been able to obtain particulars:

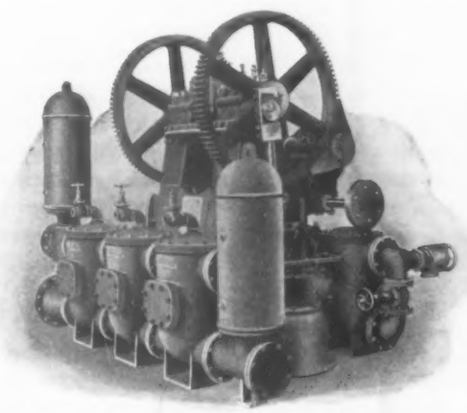
	Horse-power.
United States of America	527,467
Canada	228,225
Mexico	18,470
Venezuela	1,200
Brazil	800
Japan	3,450
Switzerland	133,302
France	161,343
Germany	81,077
Austria	16,000
Sweden	71,000
Russia	10,000
Italy	210,000
India	7,050
South Africa	2,100
Great Britain	11,906
Total horse-power	1,483,390

Judging from these, he believes it reasonable to suppose that the total amount of water power actually used for electrical production throughout the world at the present time must exceed 2,000,000 horse-power, which is about double the total steam power at present devoted in Great Britain and Ireland to the same purpose.

The Goulds Triplex Fire Pump.

In connection with the fire protecting system of the new department store building for the Sweeney Company, Buffalo, N. Y., the Goulds Mfg. Company, Seneca Falls, N. Y., has recently installed an electric triplex fire pump, a view of which is shown herewith. The pump is driven by a 100 horse-power motor and was built to meet the requirements of the Fire Underwriters' Association of Buffalo. It is bronze fitted throughout, with a water relief valve, by-pass, vacuum chamber and four discharge hose gate valves. Three of these valves may be seen in the engraving, the fourth is on the back of the pump.

The pump connects with the piping for a Grinnell sprinkler system, installed by the General Fire extinguisher Company, and is controlled by a compound and automatic hand starting device to maintain a constant pressure in the system. Connection is also made from the pump to a water curtain on the outside of the building, to protect it in case of fire in an adjoining property. At a moment's notice hundreds of jets of water may be discharged from the cornice and window frames to protect



The Goulds Motor Driven Triplex Fire Pump.

the building with a sheet of water from top to bottom. The capacity of the pump is 1000 gallons per minute, and a recent test of the system demonstrated that the required quantity can easily be delivered.

The statement is made that the dividend and interest disbursements in this city in January will break all records. A compilation by the *Journal of Commerce* indicates a total of about $136,600,000 to be paid out by leading railroad and industrial corporations, local banks, trust companies, traction companies and the National Government. This sum is nearly $3,000,000 larger than in January, 1904, when total payments of similar institutions were about $133,800,000. The payments on industrial stocks show considerable falling off because of reduction in and passing of dividends, but this is much more than offset by increased payments on the part of railroad companies and local traction companies. In July the total disbursements were about $134,700,000. The payment of such a huge sum for dividends and interest indicates the strong underlying basis for a continuance of prosperity.

Through the courtesy of the Zenith Furnace Company, Duluth, Minn., we have been furnished with a copy of the Gibson *Souvenir* of Duluth. This is an exceedingly artistic publication, which presents a large number of views taken in Duluth and its vicinity. These views show many of the business houses and handsome private residences in that city, together with picturesque points about the city and harbor. The contents of this publication will be a revelation to those who have not kept themselves well informed regarding the progress made by the enterprising city which lies at the head of the Great Lakes.

The Iron Age

New York, Thursday, December 29, 1904.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.

Federal Licenses to Corporations.

Elsewhere in this issue will be found liberal extracts from that part of the first annual report of Commissioner James R. Garfield of the National Bureau of Corporations which deals with the so-called trust problem. It is assumed that this is the Administration's plan for curbing the power of great corporations, or it would not have been promulgated as one of the official documents of a Government bureau. While it bears evidence of having been conceived with a sincere desire to meet the popular demand for the imposition of a check on corporate abuse, it certainly falls far short of what the trust "busters" would like to see done. A study of its recommendations fails to disclose anything sufficiently dangerous to an honestly managed corporation, no matter how big, to justify fears of radical interference with its operations. Yet when the report was first made public, on the 21st inst., all industrial stocks—good, bad and indifferent—suffered a decline in value which seemed to be proportioned more to the degree of recent speculative activity in them than to their reputation for substantial worth and proper management. Probably some of the phrases used by the Commissioner in discussing the question of State corporation laws were more disturbing to the speculative element than his recommendations. It was somewhat startling to learn that he had made an allusion to the State system of chartering corporations as developing "a diversity so great as to amount in operation to anarchy." Such a characterization is possibly not too severe, but the use of a word which suggests the total subversion of government evidently struck the speculative mind as indicating that the writer regarded those who are responsible for the existence of great corporations as anarchists. That further consideration of the report and its recommendations showed that the Commissioner hardly regards big corporations as enemies of society was demonstrated by the checking of the downward flight of stocks, and in some cases by a recovery of the loss which followed the first news of the character of the report.

It is primarily interesting to observe that the Commissioner's evidently thorough study of the situation has not led him to recommend a crusade against any of the so-called trusts. He recognizes the fact that anti-trust legislation, whether Federal or State, has been largely fruitless, partly because it is "an attempt to stop the operation of strictly economic law by statutory enactment" and partly because "the attempt to maintain a state of competition by prohibiting all combination, reasonable or unreasonable, is wrong in principle." With this justification of his position in favor of regulation as against attempted suppression, he proceeds to find a remedy for corporate abuses, such as dishonesty in promotion, overcapitalization, efforts to establish monopolies, disregard of the rights of minority stockholders, the suppression of information which the public should know, the manipulation of railroad rates, and a long list of other grievances which have been piled up against some of these great combinations of capital.

This remedy, he believes, lies in compelling corporations doing an interstate business to take out a Federal license or franchise which would require them to submit to a code of regulations established for the conduct of their affairs, and which license would be withdrawn in case of violation of law, with of course appropriate right of judicial appeal to prevent abuse of power by the administrative officer. He arrives at this remedy after a thorough consideration of the possibility of securing more uniform legislation from the States, and of the advantages offered by compelling corporations doing an interstate business to incorporate under the laws of the United States to be hereafter enacted. The former would appear to be futile and the latter, while legally practicable, presents difficulties so serious that it is not recommended. A Federal license or franchise to State corporations, however, would tend strongly to produce more harmonious legislation by the States, and at the same time avoid interference with State revenues derived from the taxation of corporations.

A sufficient interval has elapsed since the promulgation of the report for its discussion in the daily press and the publication of opinions of business men and legal luminaries. It is interesting to note that the press is more inclined to criticise than support the Commissioner's recommendation. From the editorial point of view, it is either an attempt to do too much or it does not go far enough. On the one hand, it is claimed that it would "abolish the States," because after the license system had gone into effect no State could give a charter to a corporation that would be worth a notary's fee. On the other hand, it would supersede the enforcement of the Sherman Anti-Trust law, under which the Federal Government can investigate any corporation engaged in interstate commerce and can even determine the precise cost of production; can ascertain whether there is restraint of trade and punish the offenders, can ascertain whether there is unfair discrimination by means of transportation and other rebates and can punish the guilty persons, thus offering opportunities for the correction of corporate abuses which, although they have never been fully employed, are claimed to present a more potent force than the Commissioner's proposed remedy. Business men generally are noncommittal, as usual, being disposed to await results rather than criticise or commend. Lawyers who have made a specialty of corporation law are not favorably impressed toward the license plan, which they think will not strike the root of the evils complained of, but argue that if a remedy is to be sought in this direction a step further should be taken and Federal incorporation should be required in the case of all corporations doing an interstate business. The current of opinion and comment apparently shows no rush of popular support to strengthen the presentation of the Commissioner's views. Possibly further study of the subject and more widespread discussion may cause his proposed remedy to grow in favor.

A most interesting occurrence in the financial world was the declaration on December 21 of a semiannual dividend of 1½ per cent. on the common stock of the Reading Company, the holding company of the Philadelphia & Reading Railroad and the Philadelphia & Reading Coal & Iron companies. This is the first dividend declaration on the common stock of this property since January 25, 1876. Since that time the company has been twice in the hands of receivers, and the holding company was the outcome of the second receivership. This incident recalls the fact that the panic of 1893 may

be said to have practically begun with the passage of the Reading interests into receivers' hands in February of that year.

The Upward Trend of Prices.

The rapidity with which the demand has overtaken the supply during the closing quarter of the year is one of the most interesting developments of the times. It seems but a short interval since the manufacturers of all kinds of finished products were discussing the probability of their being obliged to make drastic reductions to meet the views of consumers. Mills were closed or running only part time, and orders were so few that only in lines controlled by the most rigid trade agreements were prices maintained. Even in some of these lines inducements were being made to influence orders by throwing in accessories or related articles. The change which has occurred since the beginning of October will dwell long in the memories of business men as one of the most remarkable transformations in their experience. Instead of regarding the improved trade in pig iron as an indication of what was to be expected in the iron and steel trade generally, they had been inclined to think that the pig iron demand was only a temporary matter. The quickening of the demand in finished products was first seen in wire and merchant pipe, from which it rapidly spread to other lines. Not only were concessions sharply checked, but premiums began to be named when definite deliveries were desired. All traditions of trade were reversed when manufacturers began to advance prices just as winter was opening. The month of December has witnessed advances in wire, black sheets, tin plates, heavy plates, bar iron, soft steel bars and structural shapes. Billets are commanding a premium and are likely to be officially advanced in January, when some other steel products may also be marked up. Meanwhile the pig iron trade not only fully maintains the strength which it has shown throughout the whole quarter, but also presents marked indications of seeking a still higher level. The year, therefore, closes with a universally buoyant feeling.

Labor Notes.

Guerrilla warfare is still being carried on by striking members of the International Association of Machinists in Chicago, but the speedy arrest of sluggers and their prosecution by the Chicago Metal Trades Association have reduced this trouble to a minimum. Two men were fined last week for assaulting a nonunion employee of the Goss Printing Press Company.

The Bridge and Structural Iron Workers' International Union at Chicago has decided upon a schedule of 45 cents an hour for a 9-hour day for "road men" working on bridges and structures in localities not controlled by branches of the union, and has announced that after May 1 this rate shall be paid in Ohio, Indiana, Michigan, Illinois, Missouri, Kansas and Minnesota on penalty of a general strike. The local rate at Chicago is 56¼ cents an hour, with 55 cents at St. Louis. Hitherto country and railroad bridge work has been done on varying schedules, depending on the power of the union, 35 cents an hour for a 10-hour day being a common figure. The American Bridge Company, the largest employer, has not yet announced its attitude in reference to the new ultimatum of the union.

Another attempt (the sixth) was made during the night of December 23 to blow up the Newport Foundry and Machine Company's plant at Newport, Ky. The entire building was shaken by a terrific explosion of dynamite. The dynamite was dropped near a fence, and consequently little damage was done, but the explosion was heard all over the city. Five of the nonunion workmen were attacked by a large crowd of union sympathizers on the night of the 24th. One of the nonunion men was beaten into insensibility and one of the strike sympathizers was wounded with a knife.

PERSONAL.

W. C. Ralston, formerly president of the California Miners' Association, has been elected president of the Fulton Iron Works of San Francisco, Cal.

O. O. Laudig, formerly superintendent of the Sheffield Coal & Iron Company's furnaces, Sheffield, Ala., has succeeded N. B. Smith as superintendent of the furnaces of the South Chicago Furnace Company.

Charles L. Parmele, formerly with the J. W. Kreager agency, Philadelphia, is now connected with the Vandyck Churchill Company, 8 Dey street, New York, as a machine tool salesman, working from its Philadelphia store.

William A. Parker has been appointed purchasing agent of the Bessemer Railroad at Pittsburgh, Pa., controlled by the Carnegie Steel Company, to succeed J. M. Ritchie, deceased.

Edward Martin, formerly superintendent of the Ellwood City, Pa., plant of the American Sheet & Tin Plate Company, has been appointed superintendent of the sheet mills of the Niles Iron & Sheet Company, at Niles, Ohio.

William G. Mather, president of the Cleveland Cliffs Iron Company, and Capt. Samuel Mitchell of the Jackson Iron Company, will erect monuments at Negaunee, Mich., commemorative of the discovery of iron ore in the Lake Superior region.

C. W. Whitney has resigned his position as Pacific Coast representative of the McGraw Publishing Company, New York, and has become identified with the Abner Doble Company, San Francisco, engineers and manufacturers of tangential water wheels and needle regulating nozzles. Mr. Whitney will have charge of the Abner Doble Company's publicity department.

S. B. Patterson, for many years with the Andover Iron Company, Phillipsburg, N. J., has been appointed general superintendent of the Robesonia Iron Company, Reading, Pa., to succeed S. H. Chauvenet, resigned.

George W. Douglas, who has for some time been connected with the sales department of Rogers, Brown & Co., pig iron merchants, at Pittsburgh, has been transferred, to assume the duties of a more responsible position under the home office of the company at Cincinnati.

On January 1, 1905, the engineering department of the American Steel Foundries will be placed in charge of C. M. Mendenhall, with the title of chief engineer. The following officers will report direct to Mr. Mendenhall: George G. Floyd, mechanical engineer; J. V. McAdam, traveling engineer, and W. MacGregor, construction engineer.

At a meeting held last week, the Board of Directors of the Vulcan Detinning Company, Sewaren, N. J., elected Stephen A. Ginna, formerly director of the American Can Company, as president, in succession to the late Joseph B. Bloomingdale.

The Milwaukee Foundrymen's Association held its annual meeting at the Plankinton House Monday evening, December 19, at which officers for the ensuing year were elected as follows: President, A. J. Lindemann of the A. J. Lindemann & Hoverson Company; vice-president, W. J. Turner of the Western Malleable & Gray Iron Mfg. Company; secretary, W. J. Fairbairn; treasurer, Clarence Falk of the Falk Mfg. Company. A banquet followed the business session, at which Prof. John H. Gray of Chicago University, lately returned from a study of labor conditions in Europe, was the principal speaker. Charles Quarles, a prominent attorney of Milwaukee, discussed the "Open Shop;" Mr. Lindemann spoke on "Trade Schools," C. C. Tyler told of the "National Association," and W. J. Fairbairn discussed "Employment Bureaus."

Railroad Disasters in the United States.

BY EGBERT P. WATSON.

The marked increase in danger to life and limb by railroad travel in this country is exciting much attention, and suggestions of all kinds are being made to obtain greater safety and fix the responsibility for the conditions which exist. A little reflection shows that this responsibility is divided among many, and one of the parties to the indictment, if a discussion can be so called, is the public that uses railroads. Of late years a demand has arisen for rapid transit everywhere, and no velocity is too great for it. Travelers in the mass do not consider that they incur risks by fast trains if they only arrive at their destinations an hour or so earlier than by slower trains, and willingly patronize the swiftest. Another responsibility for accidents which must be fixed upon the public arises from constant trespassing upon railroad property, regardless of the danger to others which may ensue. Casualties of frequent occurrence are caused by persons driving across railways without satisfying themselves beyond question that there are no trains in sight either way before proceeding. Aside from their own peril there is another, involving the risk of wrecking the train itself. Railroads are in one sense sole owners of their highway; they have purchased the right to it and the public has no business to trespass upon it outside of travel to and fro upon the trains.

The attitude of the public in regard to rapid transit is culpable from another aspect, reminding one of the advice a worldly man gave his son: "Make money; honestly if you can, but make money." The public's rendering of this is: "Make time; safely if you can, but make time." Under the stress of this demand all sorts of risks are taken, which would not be the case at ordinary speeds. A railroad superintendent was once heard to say: "This road has rules which the engineers are supposed to observe, but we have no use for the engineer who don't get there." While all officers are not of this caliber it is by no means uncommon to find officials ignoring infractions if the man who offends is always on time.

Railroads, however, are sufferers through mishaps that no sort of prescience can prevent. Of these derailments from breakdowns, accompanied by loss of life, through defective materials are an example. Details of cars and engines which have been carefully examined and tested for tensile strength, which have served for years without fatigue, suddenly fail with disastrous results. An engine in Jersey City, some years ago, had just brought in a fast train, and being detached was about to go to the roundhouse when the main crank pin broke short off in sound metal; that is to say, it had stood the rack and strain of leagues in rapid flight and suddenly failed when resting from its labors. Not all are so fortunate, as the long lists of disasters show.

Comparisons between the number of casualties occurring in the United States and those in foreign countries cannot be justly made, for the reason that the conditions are vastly different. On most of the State owned railroads, and those under the administration of corporations as well, in many foreign countries, the railroads are fenced, and it is a penal offense to be found on the line. Any one can be apprehended if caught in the act and punished. For some reason unknown such a proceeding as an arrest for trespassing or being found on a railroad track in this country would be resented by the public at large. Moreover, the railroads themselves, in spite of the benefit they would derive from it, would doubtless object strongly to the expense involved by fencing their properties.

A discussion of the increased danger from railroad travel and the presence of railroads in thickly settled communities is fraught with difficulties by reason of the wide range of conditions which exists and the diversity of State laws relating to railroad occupation, administration and maintenance. What might be adopted in Massachusetts and may be necessary in Connecticut would stop all the systems in Minnesota and other sparsely settled States, and while legal enactments as to damages for injuries sustained would not materially affect large trunk lines it would make dividends practically impossible by smaller corporations all over the land. Suggestions to render travel safer might be operative on some routes but totally inapplicable under different surroundings and situations. The fact remains, however, that with the great increase of railroad traffic the danger to the public has been much augmented and the situation has become intolerable to every humanitarian.

The report of the Interstate Commerce Commission, which is an accurate recital of facts covering the subject, shows that the killed and injured upon the railroads of the country in the fiscal year 1902 amounted to 33,711, while in 1904 this had been increased to 43,266. No mention is made of the relative amount of business transacted in the two years, the report giving only the actual number of casualties occurring to both passengers and employees. Naturally the latter suffered the most, for where but 130 passengers were killed in 1902 and 2298 injured by collisions, &c., and in 1904 these casualties had risen to 166 killed and 3383 injured, the employees in the latter year had 464 killed and 3700 injured. By far the largest number of deaths and injuries to limbs arose from collisions. This is terribly suggestive and deplorable when it is considered that these last may be justly classed among preventible accidents. The list of maimed and dead further shows by its increase that these casualties had occurred in spite of the appliances and safeguards devised and adopted within two years, for there is no question that the authorities are eager and anxious to use everything that promises to increase the safety of travel, not merely from motives of philanthropy but as a business precaution against serious losses. This is contrary to the popular opinion of managers generally, but there is no question as to the fact stated. Here and there it is true that a "penny wise and pound foolish" superintendent may decline to put in an obvious safeguard upon the ground of expense or that no accidents of the kind it is intended to prevent have ever happened on his line, but such a man is the exception that proves the rule, the vast majority being more alive to their responsibilities.

Next to collisions the most frequent accidents are those arising to employees and passengers alike in falling from cars in getting on or off. In 1902 no less than 1194 passengers were hurt in this way, while of employees there were 1380 injured and 425 killed. In 1904 a total of 1739 employees suffered from casualties of the kind named, showing that as time went on the common enemy of mankind, carelessness, was still present, for no one can rightly affirm that this is not a preventible accident, it being no more dangerous to get off a train if proper caution is observed than it is to get out of a chair. Throughout all the special lists of accidents causing loss of life on railroads enumerated in the commission's report, the vast majority show contributory negligence on the part of those who suffered by them, augmented possibly to some extent by the acts of railroad servants.

There is no intention on my part of pleading for the railroads of the country as to their responsibility for loss of life and injuries to the person, but if remedies are to be found we must first learn the principal causes of them and reduce them as far as possible. Inquiries of railroad men of active experience confirm my own impressions concerning the frequency of accidents. Summed up, carelessness is the cause first and last where preventible cases have occurred. There are other causes which have a bearing on special catastrophes of the kind discussed, but recklessness, or condensed carelessness, as it may be called, is the chief. Men in this kind of work become so accustomed to the risks involved that they are not conscious of them, and so long as they escape by a hair's breadth from the consequences of their acts little or no notice is taken by their superiors.

A remedy for ordinary lapses or loss of presence of mind upon the part of employees is supposed to lie in mechanical devices of one sort or another which act au-

tomatically and arbitrarily in the face of danger. Trips worked by the engines themselves shut off steam at certain distances from danger points, but a difficulty that suggests itself is to discover just where these are. The New York Subway is supposed to be equipped with every device that modern ingenuity can suggest or discover to render it impossible even for the unforeseen to happen, but on December 1 a train was switched to the wrong track while at high speed and bumped into a tool car, which had no business to be where it was in any event. Switches cannot be thrown without the action of two persons, one to give a signal which unlocks the switch and another to move the lever itself. No one can tamper with a switch from curiosity or malicious intent, but in spite of this safeguard a train was thrown improperly from one track to another. This is, however, an illustration that serious accidents can happen despite every mechanical appliance which may be installed upon a railroad.

That managers do examine into the causes of all disasters and hold those concerned to rigid account for them is well known to the employees, although the popular idea is that such things are forgotten or hushed up and got out of the way as soon as the wreck is cleaned up. Superintendents of departments have close knowledge of everything transpiring under their charge, and are held to a strict accountability by their superiors. So far as human foresight can reach and experience in their duties suggest nothing is left undone to render travel safe, even to experimenting with doubtful devices in the hope that they may prove better than they appear to be.

Accidents upon railroads, then, are not always the fault of the company, but the public shares in them to a certain extent. Just how and where the responsibility can be divided so that each party bears its own burden is very difficult to state. In England there are strenuous Board of Trade regulations which govern railroad disasters. Just how far they would operate here it is not possible to say without a trial, but they appear eminently sensible and practical. Reports are required from the railroads promptly upon the occurrence of every class of accident, by telegraph if possible, by mail at once if it is not. Inspectors attached to the Board of Trade proceed promptly to the scene and act independently of the railroad officers in an inquiry as to all the causes leading up to the disaster. These inspectors have plenary powers, being magistrates authorized to administer oaths and call experts; in short, they are in a position to ferret out everything that might not otherwise be discovered. When their labors are concluded a report is made to the Board of Trade, which in return makes it public. There is no doubt that this way of arriving at the facts in any given case has had a good effect and prevented, in so far as any restraint can, a reckless administration of affairs.

It is not so understood, but laws which govern railroads should apply to trolley lines also, for they are operated upon rails. It makes no difference whether the trains are moved by electricity or steam so far as the public safety is concerned, the number of persons killed and injured daily by trolley cars being a public scandal. Where steam railroad crossings occur gross carelessness is often manifested, and the *personnel* of the trolley line employees is not as high as it should be where the conductors are concerned, their chief anxiety being to get all the fares and make time.

"It is meet that offenses come, but woe unto him by whom the offense cometh," fits the careless worker. Of what avail is it to establish automatic appliances, block signals, and, in short, safeguards of every sort, if men willfully disregard them when in plain sight, ignoring the very purpose for which they were designed?

Recent additions to the personnel of the Allis-Chalmers Company, Chicago, Ill., comprise J. U. Jones, Dallas, Texas, who will represent the company and its widely varied products in Texas and its tributary territory, and H. Schiffin, who becomes assistant manager of the mining and crushing machinery department, with headquarters at Chicago.

Lake Mining Matters.

DULUTH, MINN., December 24, 1904.—I have given in previous letters most of this year's shipments from the Mesaba range. Below are the totals from the remaining four American and the one Canadian district. For the three Michigan districts some all-rail shipments for 1904 remain unverified and incomplete, but much of what has gone all-rail to furnaces during the year is noted. The figures of 1903 include all-rail business in full. The United States Steel Corporation's all-rail shipments have been exceedingly light this year, much more so than usual. The figures follow:

	1903. Gross tons.	1904. Gross tons.
Vermillion range:		
Chandler Mining Company	460,548	422,009
Oliver Iron Mining Company	1,216,151	872,256
Totals	1,676,699	1,294,265
Michipicoten range:		
Lake Superior Company	201,387	117,153
Gogebic range:		
Anvil	11,309	45,595
Ashland	274,138	335,692
Atlantic	148,385	77,224
Aurora	355,365	212,920
Brotherton	94,986	84,870
Cary	89,221	57,114
Chicago	22,965	.....
Colby	54,915	81,289
Comet	.....	19,275
Geneva	7,108	.....
Germania	2,246	10,253
Hennepin	862	.....
Iron Belt	25,353	.....
Ironton	16,875	21,805
Jackpot	31,709	6,539
Meteor	6,156	40,322
Mikado	108,709	25,611
Montreal	93,139	125,232
New Davis	734	10,726
Newport	274,905	164,405
Norrie	790,346	618,638
Ottawa	87,929	24,026
Palms	60,800	47,744
Pike	115	.....
Sunday Lake	91,383	50,625
Tilden	211,534	204,581
Upson	310	.....
Yale	46,211	23,914
Miscellaneous	204	.....
Totals	2,912,912	2,288,400

The year's business from the Marquette range has been as follows in comparison with 1903, except that a few mines are still shipping all-rail:

	1903. Gross tons.	1904. Gross tons.
Bessie	29,718	.....
Beaufort	134,648	25,780
Breitung	7,854	.....
Cambria	41,168	83,657
Champion	74,238	.....
Chester	6,787	.....
Cleveland Cliffs Company	810,845	669,860
Cleveland Cliffs Company, all rail	.....	94,852
East New York	22,523	7,299
Foxdale	5,053	3,429
Hartford	20,085	179,980
Jackson	5,409	.....
Lake Angeline	310,950	262,486
Lake Superior	604,829	578,341
Lake Superior, all rail	.....	1,164
Lillie	77,454	42,127
Mary Charlotte	34,303	45,137
Mary Charlotte, all rail	.....	10,000
Moore	.....	25,828
Negaunee	224,665	.....
Negaunee, all rail	.....	55,000
Princeton	84,223	75,683
Regent	254,658	311,480
Republic	155,415	124,367
Richmond	55,593	68,134
Volunteer	7,395	71,870
Winthrop	72,433	.....
Total	.....	2,504,951
Including all rail returns to date	.....	160,986
Totals	3,040,245	2,665,967

Menominee range shipments for the two years have been:

	1903. Gross tons.	1904. Gross tons.
Antoine	107,886	80,684
Aragon	522,035	374,944
Baltic	123,326	154,006
Bristol	246,581	130,140
Caspian	2,088	4,243
Chapin	704,051	541,324
Commonwealth	5,051	1,617
Corrigan, McKinney & Co.	370,998	571,924
Cundy	111,851	.....
Dober	97,633	81,544
Florence	95,877	153,452
Forest	.....	11,988
Genessee	61,964	.....
Hemlock	79,420	119,577
Hiawatha	53,828	23,148
Hope	7,339	.....
Loretto	87,939	42,815
Mansfield	51,440	79,163
Millie	40,860	.....
Nanaimo	.....	9,086
Monro	8,739	32,332
Northwestern	17,280	.....
Penn Iron Mining Company	343,543	141,947
Pewabic	489,175	361,814
Quinnesec	49,708	.....
Verona	50,910	20,205
Vivian	12,122	81,343
Totals, lake and rail	3,741,284	3,047,096

If anything more were needed to confirm the statements of activity on all ranges the coming winter and during 1905, it would be found in the announcements of various companies as to operations planned and the inquiries for miners. Men seem to be scarce all along the line, and the same song is sung from all Lake districts. At the village of Crystal Falls, on the Menominee, where work has been hard to get all the year, the companies expect to employ 1000 more men than they have at work now, and this though several of the mines have already taken on a goodly number. At Iron Mountain the Chapin and Aragon are to increase materially, together with the smaller mines of the same section. Chapin is to add enough to its force to make the output for next year equal that of the mine's biggest season, 1902, when it produced 959,000 tons. The Gogebic range is adding men more slowly, and will have a smaller increase. There is not much change on the Vermillion yet, though the mines are all busy, except the Minnesota, at Tower, and there are rumors it may reopen. The Mesaba, on account of the number of open pits and the general cessation of stripping this week for the winter, has been letting many men out.

Lamont mine, at Crystal Falls, is now bailing water, and will reopen in three weeks. It employs 125 men. This is the last of the Corrigan mines of that district that is liable to resume at present, and puts into activity all their good properties. At the Mansfield mine, the Oliver Iron Mining Company is moving the shafthouse from wrecked No. 1 to new No. 2 shaft, and will have it over the bore in a few days. Bailers will lift the water from the mine through No. 2, and a new equipment will be erected.

The United States Steel Corporation has just closed the purchase of about 13,000,000 tons of ore in the ground on the western Mesaba range. This is in two properties, one of about 5,000,000 and the other of 8,000,000 tons, and the purchase, units of iron considered, is just about enough to make up for its mining operations in the entire Lake Superior region for the present year. This ore is not of high grade, the smaller property having an average of 56 iron and 0.056 phosphorus, with a considerable part of it Bessemer, the other about 55 per cent. and non-Bessemer. They carry a 25-cent royalty. The price paid for these two properties is what may be called a snap. Both properties will be underground and both are near the line of the Steel Corporation's Duluth, Missabe & Northern road. The ore market is much more active.

The Interstate Mining Company (Jones & Laughlins) will sink a third shaft at its Lincoln mine, Mesaba range, partly in order to avoid an underground tram of 1000 feet. It will be four compartment and well equipped for heavy work. D. E. W.

Iron and Industrial Stocks.

NEW YORK, December 28, 1904.

The holidays have greatly restricted operations in stocks since our last report. Transactions have therefore been very much under the volume of previous weeks. Prices have nevertheless held firm, as unfavorable influences have been lacking. Quotations have fluctuated within a narrow range, and in some instances practically the same prices have prevailed throughout the week as those reported in our last issue. Can preferred has shown much strength, advancing from 61½ to 63⅝ up to the close on Tuesday evening. The car equipment stocks, such as Car & Foundry, Locomotive, Pressed Steel and Railway Spring, have shown marked strength. Tennessee Coal advanced from 69¼ to 71¾, and United States Steel preferred advanced from 90⅝ to 92⅞. The market has been still stronger to-day, the last transactions up to 1.30 p.m. being reported as follows: Can common 12⅛, preferred 63½; Car & Foundry common 35⅛, preferred 93⅞; Locomotive common 35½, preferred 103; Colorado Fuel 47⅛; Pressed Steel common 40½, preferred 90; Railway Spring common 33⅞, preferred 93½; Republic common 17¼, preferred 70; Sloss-Sheffield common 61, preferred 103; Tennessee Coal 72¼; United States Steel common 30⅝, preferred 93½, new 5's 92⅞.

Dividends.—American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable January 21.

American Shipbuilding Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock.

Vulcan Detinning Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable January 20.

The Lebanon Valley Iron Company, Lebanon, Pa., has declared its fifth semianuual dividend of 3½ per cent. on preferred stock. It operates the Lebanon Valley furnace at Lebanon, Pa., and has closed a good year.

The New York Pig Iron Warrant Market.

Apparently but little interest was taken in Pig Iron warrant certificates this past week, the total sales aggregating 700 tons, of which were sold 100 tons December, $17.30; 100 tons, $17.20, January; 100 tons, $17.10, March; 200 tons, $17.05, and 100 tons, $17, May; 100 tons, $17.25, June. The first local certificate was issued December 27. The quotations established on call Wednesday noon show quite a difference between the offers of buyers and sellers, and are somewhat lower, especially in futures, than those noted last week. The prices are:

	Bid.	Asked.
Cash	.....	$17.50
December	$17.00	17.50
January	.....	17.30
February	.....	17.30
March	17.00	17.30
April	17.00	17.30
May	16.90	17.15
June	16.90	17.20
July	16.95	17.20

Large Orders for Steel Cars.—PITTSBURGH, PA., December 28, 1904.—At Pittsburgh the Pittsburgh & Lake Erie Railroad has placed an order for 1000 steel freight cars with the Pressed Steel Car Company for early spring delivery, and which will be built at the McKees Rocks Works of that concern. This is the third large order for steel cars placed in Pittsburgh recently. The Pittsburgh Coal Company placed an order about a week ago with the American Car & Foundry Company for 2000 steel hopper cars, and the United Coal Company ordered recently 1000 steel cars from the Standard Steel Car Company. The Pittsburgh & Lake Erie Railroad has also placed an order with the American Locomotive Works for five passenger locomotives, which will be built at the Manchester Works, in Allegheny, Pa.

The annual wage adjustment at the American Iron & Steel Works of the Jones & Laughlin Steel Company at Pittsburgh has been made for the coming year. In the cases of a few skilled employees who work on a tonnage basis a slight reduction in tonnage rates was made, but the earnings of the men will be as large as before, owing to the installing of improved equipment which will allow the men to get out a larger tonnage.

The Wheeling Steel & Iron Company of Wheeling, W. Va., has declared a stock dividend of 2 per cent.

Revival of American Machine Exports to Germany.

Consul-General Frank H. Mason, Berlin, Germany, furnishes the following interesting report to the Department of Commerce and Labor:

For several obvious reasons, which have been cited from time to time in these reports, the exports of American machinery and machine tools, which reached their highest development in 1899-1900, declined in 1902 to about one-third of their greatest volume. The causes of this falling off were mainly three: The general prostration of manufacturing industries in Germany at that time; the fact that German machine shops equipped with American machinery had learned to duplicate most of such machines and many other articles at less than the cost of the imported originals, and that many American manufacturers had established branch factories in Germany, the products of which competed directly with the output of the parent manufactories in the United States.

It is now apparent that the period of lowest depression is definitely past, and that, notwithstanding all adverse influences, the export of American machinery to Germany is increasing in due proportion to the general recovery of industrial activity in this country. The measure of this renaissance of a once flourishing and important trade will be apparent from the following comparison of the total imports of certain classes of American machinery during the first nine months of the years 1903 and 1904:

Kind of machinery.	1903. Metric tons.	1904. Metric tons.
Sewing machines	1,570	2,339
Machine tools	724	1,634
Metal cutting and boring machines	91	206
Pumps	109	142
Typewriters	90	114
Electrical machines	27	63

Two reasons are ascribed for this rather unexpected increase in the machine imports which compete most directly with home made products—namely, the conviction which prevails in many quarters that the original machine, made in the country where it was invented, is superior to any copy or reproduction of alien origin, and, secondly, the fact that since the demands of the American home market have relaxed, with the diminished activity of the past 15 months, our manufacturers and exporters have given more attention and effort to their foreign trade.

It is just this point in the present revival that is worthy of being recorded and its significance recognized. In an old and highly developed country like Germany, where not only the wants of its people in manufactured merchandise are fully covered by home made products but a large surplus of most goods is produced for export, the importation of similar wares from foreign countries must depend largely upon the intelligence and energy with which trade is pushed by the exporter and his agents in German markets. It is a settled belief in Europe that Americans, although unsurpassed as manufacturers and caterers to their own countrymen, have only an incidental interest in foreign trade, and that this interest, such as it is, fluctuates in close and direct relation to the condition and demands of the home market. During the highly prosperous period of 1902-1903 in the United States the export of many articles to Europe languished because manufacturers at home were too busy to attend to orders and correspondence from abroad. Complaints were frequently brought to consulates that American exporting firms would not even answer inquiries as to prices and conditions of delivery. It was at this time that the financial correspondent of the London *Times*, being sent to make an exhaustive study of the growing "danger" in the United States, encouraged his readers with the assurance that:

> The truth is that foreign trade in any systematic way is now beyond the knowledge of the American people. I was almost tempted to say that it is beyond their desires and intentions. That in an indefinite way they would like to have a foreign trade is perhaps true; but for the reason that they have been so long accustomed to look to the home market it is impossible for them to take the steps that would give them any considerable share in foreign markets. After all, Americans are the most conservative people in the world so far as outside conditions are concerned, and so where these are involved they are content to go on doing a foreign trade that is merely complimentary to the home trade. If Count Goluchowski and some of the German, Russian and French dreamers could only know the real truth about this people they would have little reason to concern themselves with their new bogey, the "American danger."

This is of course an extreme and therefore misleading statement of the case. The fact is that a great many, perhaps a majority, of American manufacturers and merchants are indifferent to export trade, and as a consequence careless and ignorant concerning the methods by which it should be developed and maintained. They regard foreign markets only as a convenient outlet for their surplus products in time of overproduction resulting from dullness and depression in the home demand. Notwithstanding all that has been said and written, they go on sending catalogues and circulars in English with values in dollars, weights in avoirdupois, measurements in feet and inches. They insist rigidly on American terms "Cash against B. of L.," and kindly inclose a United States stamped envelope for the reply of the expected customer.

But, on the other hand, there are a large number of American manufacturers and exporters who really know that they want export trade and have taken up the work of establishing, developing and maintaining it with all the energy, skill and adroit adaptation of means to ends which distinguishes them as manufacturers and caterers to their home trade. They have come to Germany and established agencies, either with German firms of high standing or as branch offices under their own management; their skilled salesmen have traveled over the Empire with samples and price-lists printed in German units and currency, and their goods are known here for just what they are, no more nor less. It may fairly be assumed that when the manufacturers and merchants of the United States definitely make up their minds that they want a broadly developed, progressive and permanent foreign trade, they will go about the work of obtaining it as ably and successfully as they have mastered the resources and capabilities of their own country.

It is because American pumps, machinery, typewriters, shoes and many other manufactured articles are well known and appreciated here that the demand for them has recovered and kept pace with the general revival of prosperity in this country. The greatly increased importations of the past nine months are evidence of a vitality in the German market that will repay any intelligent, well considered and directed effort. No European people buy more readily and liberally what they want, none are more free from narrow prejudice against merchandise of foreign origin, none are more keenly interested in every novelty and valuable improvement than the Germans. If the field here is less ready and easily worked than it was ten years ago, it is only because German manufacturers now supply cheaply and in unsurpassed quality many of the goods which were then imported, but there are still lucrative markets in the Fatherland for those who will seek them discerningly and cultivate them with intelligent and persistent energy.

Arizona's copper production has been making great strides in the last few years. The following table shows an estimate by a territorial authority of the output in 1904 of the most prominent copper properties in Arizona:

	Pounds.
Arizona Copper Company	28,000,000
Calumet & Arizona Mining Company	34,000,000
Copper Queen Company	58,000,000
Detroit Copper Company	18,000,000
Old Dominion Company	16,000,000
Sharron Copper Company	12,000,000
Troy Manhattan Company	500,000
United Verde Copper Company	34,000,000
Small companies	10,000,000
Total	210,500,000

Neville Island Furnace of the American Steel & Wire Company at Pittsburgh, which has been idle for more than a year, is preparing for blast and will blow in within the next week.

MANUFACTURING.

Iron and Steel.

Wickes Brothers, Pittsburgh, Pa., have received a contract to erect a steel addition, 70 x 100 feet, to the plant of the Allegheny Steel & Iron Company, Avenue, Pa. This addition is to contain another 50-ton open hearth furnace, which is to be installed by the S. R. Smythe Company, engineer and contractor, House Building, Pittsburgh.

The Bessemer works and the rail mill of the Lackawanna Steel Company, Buffalo, were reopened Tuesday, 27th inst., after a shut down of three weeks. Owing to the large number of orders on hand further shut downs this winter are improbable.

The Red River Iron Company, Clarksville, Tenn., will blow in its Helen Furnace about February 15, by which time the company expects to have accumulated 15,000 tons of iron ore to provide against all ordinary contingencies or risk of a shut down on account of reduced ore supply incident to bad weather or other causes.

The rolling mills of the Iron & Steel Company of Canada, at Belleville, Ont., were recently offered for sale at public auction, but no sale was made, as the reserve bid was not reached. Two bids were made for the mills—one of $25,000 and another of $50,000.

C. F. Ernst's Sons, dealers in iron and steel, Buffalo, N. Y., have been incorporated with a capital stock of $100,000.

Owing to trouble in getting a full force of men and also a full supply of coke, the Donora blast furnaces of the Carnegie Steel Company, at Donora, Pa., will not be started until about January 5 or later. As soon as the furnaces have started and a supply of metal has been secured, the Donora open hearth plant, containing 12 50-ton open hearth furnaces, will be started up.

Edith Furnace of the American Steel & Wire Company, in Allegheny, Pa., which has been idle for more than a year, was started up last week.

The Pennsylvania Steel Company may start the company's small furnace at Lebanon in February or March. It was blown out in August and will be ready some time in February.

New rolls have been put in the Douglasville Iron Company's rolling mills at Douglasville, Pa., and they will start soon. Two trains have been practically rebuilt by the owners.

The Kokomo Steel & Wire Company, Kokomo, Ind., has declared its first dividend, 1½ per cent. quarterly. The company was organized three years ago with a capitalization of $1,000,000. The plant includes a rod mill and two wire and nail mills. The company had considerable trouble the first year on account of a hard fight with competitors, but since then its business has grown and it has been specially prosperous during the last six months. It reports excellent prospects for 1905.

The work of re-equipping the tin plate mill at Atlanta, Ind., has been resumed, after a year's cessation. It is expected the mill will be in operation by April. The plant represents an investment of $200,000 by Atlanta and Indianapolis business men. The suspension of work last year was caused by a lack of capital, but recently $100,000 worth of stock was sold.

General Machinery.

Springer & Lister, Knoxville, Tenn., founders and machinists, have not yet purchased the entire equipment for their new plant. So far two lathes, one drill, one shaper, band saw, engine and boiler, and some other equipment has been secured. The firm will pay particular attention to the manufacture of marble working machinery.

Because of the similarity to the name of another corporation in the same city, which caused innumerable errors in correspondence, the Harman-Cogger Company, Bloomsburg, Pa., has changed its name to the Bloomsburg Foundry & Engineering Works.

The organization of the Sumter Machinery Company, Charleston, S. C., is about completed, and the erection of buildings for the foundry and machine shop is expected to be started within the next two months. The company will do a general foundry and machine business. Geo. D. Shore and C. G. Rowland are among those interested in the new enterprise.

The Globe Iron Works Company, Menominee, Wis., has installed in its new plant the following machinery: One Ransom disk grinder, one 6-foot Bickford boring and turning mill; one Oesterlein cutter and reamer grinder; one emery grinder. The remaining equipment of the plant is machinery which was brought to Menominee from the company's old plant at Minneapolis.

At the recent meeting of the American Seeding Machine Company, held at Hoboken, N. J., the following directors were elected: E. C. Buchwalter, Richard A. Rodgers, Frank C. Johnson, James A. Carr, Burton J. Westcott, W. G. Munn, A. M. Bentley, Geo McNeir and John J. Treacy.

The Lackawanna Railroad will begin to move to the large new railroad shops at Keyser Valley, near Scranton, Pa., about January 3. The great shops have been completed, and in less than a week after removal the new car shops will be in operation. Several hundred men will be employed.

The United Engineering & Foundry Company, Pittsburgh, Pa., has sold an 18-inch mill and shears to Siviter & Co., Boston.

Decatur, Ind., has voted a subsidy of $28,000 to secure the railroad shops of the Toledo, St. Louis & Western road. A refrigerator plant, roundhouse, &c., will also be erected.

Power Plant Equipment.

A new water power plant which will have the highest head of any in existence is projected by the Central California Electric Company. This corporation is controlled by the same interests as the South Yuba Water Company, and is operating three water power plants, transmitting electric power to Sacramento, Grass Valley and other cities. Preliminary surveys for the new plant are now in progress. The proposed plant will have a capacity of 25,000 horse-power, and will be located on the banks of the American River at Alta Station, 60 miles from Sacramento. The water, after passing the present pump station at Alta, will be carried by a short canal to a point where a drop of 2100 feet can be obtained. The Platt Iron Works, formerly the Stillwell-Bierce & Smith-Vaile Company, Dayton, Ohio, will design the hydraulic machinery. The turbines will resemble the Escher-Wyss pattern, which is built in Switzerland. Four direct connected units will be installed consisting of polyphase generators having a capacity of either 4000 or 5000 kw. each. They will run at a speed of 750 revolutions per minute, which is a much higher speed than has been used before.

J. D. Lyon & Co., Farmers' Bank Building, Pittsburgh, have sold to the Central Ohio Roofing Company, Columbus, Ohio, for its Groveport plant, a 16 x 22 inch Mertes duplex heavy duty gas engine.

The McClave-Brooks Company, Scranton, Pa., is completing the insulation of 12 McClave stokers at the new power plant of the Lehigh Railroad Company, Sayre, Pa.

Contract lettings by the city of St. Joseph, Mo., December 10, for engines, boilers and steel chimneys, were as follows: Engines, Minneapolis Steel & Machinery Company, Minneapolis, Minn., $3428; boilers, Kansas City Engineering Company, Kansas City, Mo., three 200 horse-power, $5902; steel chimney, T. C. Augustine, St. Joseph, Mo., $3225.

E. A. Kingsley, city engineer and superintendent of public works, Little Rock, Ark., writes that plans are being prepared for a $2000 addition to the electric light plant at Little Rock, which will house new boilers. It is expected to expend $8000 or $10,000 additional for the boilers at once, leaving room for additional boilers when found necessary.

A new factory is promised Milwaukee, Wis., in a plant which is now being planned by the Waite Gas Engine Company, owner of the American and foreign patents on the new Waite gas engine. The first engine has already been set up by the inventor, H. C. Waite, and is now in daily operation, furnishing power required to run a machine shop, where its performance is stated as being highly satisfactory.

The William Tod Company, engineer, founder and machinist, Youngstown, Ohio, has received a contract for two pairs of twin engines to be used for driving the structural mills of the Illinois Steel Company, at Chicago, one for driving the 28-inch mill and the other the 32-inch mill. These engines are of a new design, and some details of their construction have not as yet been fully worked out.

Bridges and Buildings.

The Chicago & Northwestern Railway is constructing a steel bridge at Millbrig, near Galena, Ill., to cost $17,000.

The American Bridge Company, Beaver Falls, Pa., has received a contract for the building of a steel bridge at Seelyville, Pa., at its bid of $16,100.

The Commonwealth of Pennsylvania has awarded a contract for a bridge over Lackawanna River in Wayne County, Pa., to the Penn Bridge Company, Beaver Falls, Pa., for $16,100. The firm of Nelson & Buchanan, Chambersburg, Pa., received a contract for a bridge over Nescopeck Creek, Luzerne County, Pa., at $10,844. There were 32 bids received for these two bridges.

Fires.

The plant of the Fleetwood Foundry & Machine Company, Fleetwood, Pa., was damaged $12,000 by fire last week.

The Wayland Cement Works, near Perkinsville, N. Y., were destroyed by fire December 25. The loss is placed at about $200,000.

William Forgie's machine shop, lumber yard and warehouse at Washington, Pa., were burned December 23, causing a loss of about $75,000.

The foundry and machine shops of A. W. Annis at Cherry Creek, N. Y., were recently destroyed by fire. The loss is estimated at several thousand dollars.

A manufacturing building at Bristol, Conn., owned by the Turner Heater Company, was burned December 19. The Turner Heater Company lost $20,000, including $10,000 on the building;

and A. H. & H. A. Warner, toy manufacturers, lost a stock of goods valued at $5000.

The plant of the Bryant Box Company, Westfield, Mass., was damaged by fire to the extent of $12,000 December 23.

The Passumpsic Fibre Leather Company, St. Johnsbury, Vt., sustained a loss of $40,000 by a fire December 19.

The greater part of the plant of the Almendares Cement Company, Havana, Cuba, was destroyed by fire December 27. The loss is about $300,000.

A fire at the plant of the S. Obermayer Company, Cincinnati, Ohio, on December 25, did $5000 damage.

Hardware.

The Tammany Organette Company, Stamford, Conn., will shortly commence the manufacture of automatic musical instruments in the factory at the corner of Pacific and Walnut streets formerly occupied by the H. A. Tuttle Mfg. Company.

Warwood Tool Company, Wheeling, W. Va., expects to take possession of its new plant in January. The company manufactures picks, mattocks, grub hoes, hazel hoes, coal miners' tools, sledges, crowbars and wedges.

Grand Rapids Furniture Company, Grand Rapids, Mich., has been incorporated with a capital of $50,000 for the purpose of manufacturing window screens, patents on which are pending.

The Bronson-Walton Company, Cleveland, Ohio, manufacturer of coffee mills, roasters and bakers, bulldog wire rope clamps and Never Burn dripping pans, is putting up a new building, for which a lot of new machinery has been ordered. This will enable the company to take care of the increased demand for goods which it is expecting during the coming year, and which has already made itself felt.

William Schimper & Co., Hoboken, N. J., manufacturers of fine silver plated novelties and sterling silver and metal goods of every description, who were burned out a short time since, expect to be in running order again on three floors of their plant about January 1. Their 1905 sample line will be ready for the trade as usual.

Henry J. Weible, Delphos, Ohio, who makes a specialty of hand shaved handles, made from selected second growth hickory, expects to be operating a new plant at Bluffton, Ind., by February 1.

Foundries.

The plant of the Lebanon Foundry Company, Lebanon, Pa., has now passed into the hands of the Thomas Reese, Jr., Company.

Miscellaneous.

Miller, Hall & Son, makers of brass and iron bedsteads, Chicago, have purchased a lot adjoining their present plant, and will erect thereon a three-story and basement factory, 50 x 126 feet, at a cost of $25,000.

The Carthage Grain Door Company, Carthage, Mo., has been organized under the laws of Missouri to make a patent grain door to be used on freight cars, the invention of George Grigg. The officers of the company, which is capitalized for $50,000, are: President, J. L. Ross; vice-president, G. R. Grigg; treasurer, J. C. McGee; secretary, M. M. James. Active measures will soon be taken to secure a suitable location and to erect or purchase a factory building for the manufacture of the grain doors.

A new building, 50 x 140 feet, is to be erected in the spring by the American Pulley Company, Philadelphia, Pa., the steel columns and trusses for which will be ordered shortly.

No machinery was destroyed by the recent fire which damaged the plant of the Bradley Car Works, Worcester, Mass. The principal loss, aside from the building, was the kiln dried lumber stock.

The Raymond Mfg. Company expects to make some extensive improvements to its stove plant in order to increase the molding floor capacity. The company is now installing a new nickel plant and a new cleaning room outfit, and contemplates moving and increasing the size of the plate room.

The Butler Construction Company, Butler, Pa., has gone into the hands of a receiver, having debts amounting to $6000 or more which it claims it is unable to pay.

The Duquesne Construction Company has been incorporated at Jamestown, N. Y., for the manufacture of the Duquesne motor car. Wm. J. Maddox is president; Frank L. Bliss, vice-president; B. D. Phillips, treasurer, and M. R. Stevenson, secretary.

The Greensboro Natural Gas Company, Washington, Pa., capitalized at $300,000, has been merged with the Johnetta Gas Company, capitalized at $100,000. The new company will be called the Greensboro Gas Company and will be capitalized at $1,000,000. John W. Shay, Washington, is president; Joseph W. Craig, Pittsburgh, vice-president, and Charles W. Bauer, Pittsburgh, secretary and treasurer.

The Pittsburgh Coal Company, Pittsburgh, Pa., has placed a contract with the American Car & Foundry Company for 2000 50-ton steel coal cars. Of this 600 are for the Monongahela River Consolidated Coal & Coke Company, controlled by the Pittsburgh Coal Company. Deliveries are to be made from March 1 to July 15. Competition was severe and it is understood a low price was made.

The Phelps Light Company has been incorporated at Buffalo, N. Y., with a capital of $50,000, for the purpose of manufacturing devices for artificial lighting and heating. The directors are Edward W Phelps, Wm. Hocker and Fran kH. Callan of Buffalo, and Henry C. Wiedrich of Batavia, N. Y.

The Universal Pneumatic Transmission Company, Chicago, is endeavoring to secure franchises for the extension of an 18-inch pipe line connecting Chicago and Milwaukee, for the transmission of express, mail and light freight matter. The Postal Department is stated to be investigating the merits of the Universal system with a view to adopting it on long lines in Chicago and other cities.

The receivers of the Neafie & Levy Shipbuilding Company, Philadelphia, Pa., have been authorized by the court to issue $200,000 more of receivers' certificates, in order that they may be able to borrow money with which to carry on operations at the plant, paying the wages of the workmen and other expenses.

The W. F. Greene Company, Mechanicville, N. Y., recently incorporated with a capital stock of $25,000, has purchased the stove trimming business formerly carried on by W. F. Greene, Troy, N. Y., and has moved it to Mechanicville. A. C. Kniskern is president and R. V. Tompkins secretary and treasurer.

W. W. Stall, president and manager of the Factory Exchange, reports that he has leased a large water power plant at Walpole to the Helburn Leather Company, Boston, Mass. The plant will be fitted up at once for the manufacture of a line of fine goods.

An order of considerable interest to the agricultural implement trade is that just taken by the A. B. Farquhar Company, York, Pa. It is for 30 horse-power traction engines for a firm which will send them to Egypt for general farm use.

After having experimented with about every known type of air brake, the Cleveland Electric Railroad has placed an order with the National Electric Company, Milwaukee, Wis., for several carloads of air brakes, which will be installed under the new convertible cars. In this type of brake the air is supplied by a compressor operated by an electric motor under the car. A number of the electric roads in the larger cities are equipping their cars with the National apparatus.

The new factory building of the Hope Webbing Company at Pawtucket, R. I., 85 x 325 feet, presents an interesting application of the fan system of heating and ventilation. In connection with an old building and contemplated additions the total cubic contents amount to about 875,000 cubic feet. In this installation, made by the B. F. Sturtevant Company, Boston, Mass., the distributing ducts occupy no valuable space, for the heated air is forced through an underground system into vertical flues, which are built into the brick walls. From these flues the air is admitted in the usual manner through openings about 8 feet above floor level. With this arrangement it is possible to concentrate all of the heating surface in a single fire proof casing in connection with the fan, and to eliminate from the entire building all extended systems of steam piping. The plenum system, under which the air is forced into the building, insures a continuous and invigorating air supply.

A petition in bankruptcy has been filed against the W. H. Gough Electric Company, Syracuse, N. Y. The assets are placed at $11,000, and liabilities, $15,000.

The Canadian Corundum Wheel Company, Hamilton, Canada, is to take up the manufacture of vitrified wheels in addition to its regular line of adamite, emery and corundum wheels. To accommodate the new department the plant is being considerably enlarged. The new buildings are expected to be ready for operation in the early part of January, and the equipment has all been secured with the exception of a modern side face lathe for turning emery wheels.

The Jas. H. Billington Company, Philadelphia, Pa., manufacturer of mill supplies, has purchased the mill supply business, including the manufacture of loom pickers, formerly conducted by James Smith & Co. The Billington Company has purchased a site, upon which it will erect a building, 26 x 190 feet, three stories, for the manufacture of mill supplies.

The Westlake Construction Company, St. Louis, Mo., secured the general contract for the new dry goods store of L. S. Ayres & Co., Indianapolis, Ind., which is to cost $300,000. The Noelke-Richards Iron Works, Indianapolis, secured the iron work. The building will have four passenger elevators and one freight elevator, a package chute on the order of a spiral fire escape, and an automatic sprinkling system.

The Wabash Buggy Company, Vincennes, Ind., has made an assignment to James Kingsbury for the benefit of its creditors.

The old Hamlin Car & Wheel Mfg. Company, Catawissa, Pa., and later known as the Catawissa Car & Foundry Company, has gone out of existence and has been absorbed by the Pennsylvania Car Works, which will put the plant in operation about the first of the year. The company starts off with some very nice orders on its books. George W. Gruver of Wilkes-Barre is president, and J. K. Lockard of Bloomsburg, general manager.

Trade Publications.

Automatic Threading Lathes.—The Automatic Machine Company, Bridgeport, Conn., has issued a catalogue on automatic lathes for threading worms, nuts and screws. These are made in several forms and sizes. The smallest is capable of threading external diameters up to 2 inches and internal diameters up to 3 inches. It is made in over all lengths of from 6 to 16 feet; the shortest has a distance of 32 inches between centers and the longest 152 inches. It is made for belt drive with or without back gears, or for motor drive, and also made with or without taper attachments. A special 12-inch by 4-foot lathe is also shown, this being of the pattern described in *The Iron Age* of July 7. The catalogue contains quite a little useful information on the subject of thread cutting.

Pumping Machinery.—The Hill Machine Company, Anderson, Ind., is distributing an illustrated catalogue on this subject. It contains some 60 pages and an appended index; the various forms of pumps being classified are easily referred to. Hints to buyers, rules, formulæ and information are included, which will be useful in selecting the proper pump for any special purpose. A few of the styles of pumps shown are steam deep well pumping engines, power deep well pumping heads, pumping jacks, house pumps, double acting geared power pumps, direct acting steam pumps and boiler feeders.

Recording Electrical Instruments.—Catalogue No. 16 from the Bristol Company, Waterbury, Conn., shows the various forms of recording volt, ampere and watt meters which it manufactures. It supersedes all previous issues and has lately been revised to show all of the newest forms. It contains about 40 pages and is 9 x 12 inches in size. Descriptions are given of the several instruments, *fac-similes* of charts with records, list prices of all the various forms for direct and alternating currents, specimen sections from standard charts showing the various calibrations, and accessory apparatus, such as carrying cases, files, inks, &c.

Valves.—Special Catalogue No. 100, from the Crane Company, Chicago, Ill., is descriptive of Crane's patent pop safety valves, for stationary, marine, locomotive and portable boilers: water relief valves; cylinder relief and snifting valves; hydraulic relief valves; boiler trimmings; globe, angle and straightway, and check valves for standard, medium and high pressure. It is a very comprehensive catalogue of some 90 odd pages, with an alphabetical appended index. Tables of lists and sizes are given with each piece of apparatus illustrated. A circular from the same concern illustrates the company's recent exhibit at the World's Fair, St. Louis, and another circular briefly describes and gives price-list of Crane renewable seat and disk, globe and angle valves; renewable seats and wedge straightway valves for high pressure service; also self packing radiator valves and self packing globe and angle valves.

Gas Engines.—"The Whole Story of the Woodpecker" is the title of a catalogue, descriptive of the Woodpecker gas and gasoline engines, manufactured by the Middletown Machine Company, Middletown, Ohio. In addition to several general views of the engine, numerous line drawings are given, showing sections and details, to bring out the principal features of its construction. The engine is particularly adapted for portable rigs for performing outdoor service, such as pumping and the furnishing of power to contractors' or farmers' machinery. A considerable part of the book is devoted to testimonial letters.

Inspirators.—A general catalogue from the Hancock Inspirator Company, 85 Liberty street, New York, has recently been received. Aside from its description of inspirators, ejectors and kindred goods, it contains an interesting illustrated description of the factory at Boston, Mass. This goes into the sizes of the buildings, the arrangement of the departments, the equipment and work handling facilities. Another interesting section gives a history of the Hancock inspirator, showing some of its earliest forms as contrasted with those of the present time. Another part contains general suggestions and information, and instructions as to how to select the proper size of inspirator.

Steam Specialties.—The Kitts Mfg. Company, Oswego, N. Y., has issued a catalogue covering such steam specialties as steam traps, reducing valves, safety water columns (both high and low), low water alarms (for steam carriages), boiler feeders, boiler feed pump governors and Kitts hydraulic improved damper regulator. An illustration is given of each piece of apparatus, with a short description and price-list of the various sizes. The latter part of the book contains tables and useful information in connection with steam engineering.

Mine and Industrial Cars.—Catalogue No. 36 from the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, illustrates and describes steel and wooden mining and industrial cars. The catalogue is devoted exclusively to this branch of the firm's operations and shows cars for all purposes. These include steel ore and mine cars arranged to dump various ways, sand cars, cupola cars, mine skips, hopper cars, rocker dump cars, tank cars, flat cars, core oven cars, &c. The latter part also contains illustrations and descriptions of various forms of buckets, including self dumping buckets. A comprehensive alphabetical index is given at the front of the catalogue for several kinds of cars.

Gas and Gasoline Engines.—The gas, gasoline and oil engines manufactured by the St. Mary's Machine Company, St. Marys, Ohio, are described in a recent catalogue. This deals with several forms of engines in general and takes up the construction of the St. Mary's engines in detail. Half-tone illustrations show the engine and special applications, including the duplex form, one specially intended for driving an electric generator, &c. A page discusses the comparative economy of steam, gas and gasoline engines. The latter part of the book concerns the Likens clutch pulley, flanged face and compression couplings, pulleys, hangers, &c.

Iron Cement and Compounds.—The Smooth-On Mfg. Company, 572 Communipaw avenue, Jersey City, N. J., has recently gotten out a little 100-page book showing its different products. These include Smooth-On castings, an iron cement for repairing blemishes, blow holes or defects in iron and steel castings; Smooth-On compound No. 1, an iron cement for repairing leaks or making connections in steam or hydraulic work, which withstands fire; compound No. 2, an iron cement for coating the inside seams and rivets or leaks in steam boilers, which is applied with a brush; Smooth-On joints, a metallic cement for connecting bell and spigot cast iron pipe, and Smooth-On scale, the name for a number of different compounds and preparations for the prevention and removal of scale in steam boilers. The book contains a number of instances of repair work on which one or another of these cements was used, and gives a number of notable instances of other applications.

NOTES.

The Macungie Brass & Mfg. Company, Macungie, Pa., has recently placed on the market a new hydrant known as the Niagara, which is described as automatic, antifriction and self closing. A circular is now being distributed.

The Ingersoll Milling Machine Company, Rockford, Ill., in a little circular recently issued shows the many ways of using an Ingersoll milling machine.

The Rand Drill Company, 128 Broadway, New York, has issued circular No. 14, which gives illustrations and specification tables of Imperial pneumatic hammers and Imperial piston air drills. It also shows an air motor hoist and five forms of compressors. Various illustrations show the apparatus in use.

The Cutler-Hammer Mfg. Company, Milwaukee, Wis., has brought out a large hanger showing some of the many different types of electric controlling apparatus which it manufactures, these including starting boxes, speed controllers, rheostats, magnetic switches, &c. Under each illustration is printed the number of the bulletin which the company issues containing a description of the piece of apparatus just above. A half-tone in the center of the hanger shows a view of the works.

The Stanley Electric Mfg. Company, Pittsfield, Mass., has published a hanger about 3 x 4 feet in size, which shows a map of a section of California with notable long distance electric transmission lines marked in red. The present longest transmission distance is 232 miles, from De Sabla power house to Sausalito via Cordelia. Ten thousand horse-power is being regularly delivered into San Francisco from Electra via Stockton and Mission San José, a distance of 147 miles.

The Garvin Machine Company, Spring and Varick streets, New York City, has lately issued a pocket catalogue on the special machinery which it manufactures. It is particularly addressed to manufacturers of duplicate parts, who may possibly be following the ordinary general tool methods. The illustrations are small and many and under each is given a very brief description. The same company is also sending out a little booklet on the Garvin new solid extended knee, which is one of the prominent features of its milling machines.

The Carborundum Company, Niagara Falls, N. Y., has taken a patriotic way of advertising in its latest booklet, which is entitled "This Country of Ours." The first half of the book contains historical notes concerning several of the larger cities of the United States, leading up to Niagara Falls, and a description of the power houses of the Niagara Falls Power Company. The latter half of the book is a description of the Carborundum Company's works.

The Holtzer-Cabot Electric Company, Boston (Brookline), Mass., has issued bulletins Nos. 202 and 203. The first pertains to telephone receivers and the second to elevator motors.

The Electric Storage Battery Company, Allegheny avenue and Nineteenth street, Philadelphia, Pa., has issued a little pocket memorandum book with celluloid covers, intended to give engineers in convenient form such information and data as is frequently issued by them. It contains brief descriptions of different classes of storage battery installations intended only to give a general idea of the adaptability of this form of energy to various purposes.

P. Blaisdell & Co., Worcester, Mass., are distributing a circular giving an illustration and description of the Blaisdell 20-inch special high speed lathe. This lathe was described in *The Iron Age* of October 6.

The American Engine Company, Bound Brook, N. J., in a little folder illustrates with small half-tones the American-Ball duplex compound engine. The text calls attention to its advantages and testimonial letters are printed, together with a list of a few of the users of the engine.

The National Equipment Company, Holland Building, St. Louis, Mo., has lately issued steam bulletin No. 11, containing a full description of the Branch steam traps and Branch National boiler compound. It contains a number of testimonial letters.

The Crocker-Wheeler Company, Ampere, N. J., in bulletin No. 49, is sending out a description of the railway generators which this company had on exhibition at the Louisiana Purchase Exposition, in the Intramural Railway power plant. These generators are now for sale and the company takes this way of advertising the fact.

The Iron and Metal Trades

The outlook is very encouraging in nearly every direction. While generally speaking the volume of new business during the past week has naturally been rather light, still quite a number of large transactions have been closed.

Somewhat exaggerated reports find their way into print which should be corrected. Thus, it has been given out that the United States Steel Corporation now has orders aggregating more than 5,000,000 tons. That is not quite true, since the total does not run up to that figure and is not equal to the record. It is, however, much larger than it has been and is exceedingly satisfactory.

A good deal of tonnage has been entered by the Structural shops. Works in the Pittsburgh district have captured the work, amounting to about 12,000 tons, for the New York Central road and 6000 tons for the Delaware, Lackawanna & Western. The leading interest has taken 5000 tons of bridge work for the Cincinnati, Hamilton & Dayton road and 3000 tons for the Pennsylvania lines West. Some very large requirements are still in the market, among which is a lot of 14,000 tons of bridge work for the Harriman lines.

None of the large Steel Rail contracts pending has been closed during the week, but the volume of business already done is indicated by the fact that the United States Steel Corporation's mills have now on the books 425,000 tons of Rails for next year's delivery. Some export business of great magnitude is pending, and there are also some inquiries from Mexico, among them one lot of 17,000 tons.

Steel makers in eastern Pennsylvania have purchased some good sized lots of Basic Pig at $16.50, delivered, and one lot of 5000 tons of Low Phosphorus Pig has been taken by a western Pennsylvania plant. Buffalo furnaces have done considerable business recently, among the orders being one lot of 3000 tons of Mill Iron for the Albany district and one lot of about 9000 tons of Foundry Iron for northern New York delivery.

The furnace and foundry interests throughout the Central West and the East have been much relieved by the copious rains in the coke regions, which hold out the promise of more regular and more abundant supplies of fuel.

In the Cast Iron Pipe trade interest centers in the coming opening of bids for 10,000 net tons for the Brooklyn water service.

The large orders for Steel Merchant Pipe for pipe lines have not yet been placed. The outlook for a large tonnage in this direction is regarded as very good.

Toward the close of last week a number of advances in prices in the lighter branches were announced. These include $2 per ton on Black Sheets, $1 per square on Black and $2 per square on Galvanized Corrugated Roofing Sheets, and 10c. per box on Tin Plate.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Dec.28, 1904.	Dec.21, 1904.	Nov.30, 1904.	Dec.30, 1903.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	**$17.25**	$17.25	$16.50	$15.00
Foundry Pig No. 2, Southern, Cincinnati	**16.25**	15.75	15.75	12.00
Foundry Pig No. 2, Local, Chicago	**17.00**	17.00	16.00	14.50
Bessemer Pig, Pittsburgh	**16.85**	16.85	16.35	14.10
Gray Forge, Pittsburgh	**15.85**	15.85	15.85	13.00
Lake Superior Charcoal, Chicago	**18.50**	18.50	17.00	16.75
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	**22.00**	21.00	21.00	23.00
Steel Billets, Philadelphia	**25.00**	25.00	24.50	24.25
Steel Billets, Chicago	**25.00**	24.00	24.00	24.00
Wire Rods, Pittsburgh	**30.00**	30.00	28.00	30.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**16.00**	15.50	15.00	9.50
O. Steel Rails, Philadelphia	**17.00**	17.00	16.00	11.50
O. Iron Rails, Chicago	**22.25**	22.00	22.00	13.00
O. Iron Rails, Philadelphia	**20.00**	20.00	18.50	14.50
O. Car Wheels, Chicago	**16.75**	16.50	15.50	13.00
O. Car Wheels, Philadelphia	**15.00**	15.00	14.00	12.75
Heavy Steel Scrap, Pittsburgh	**16.50**	16.50	16.00	11.00
Heavy Steel Scrap, Chicago	**15.00**	14.25	14.00	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.63½**	1.63½	1.53½	1.35
Common Iron Bars, Chicago	**1.65**	1.65	1.55	1.30
Comon Iron Bars, Pittsburgh	**1.69¾**	1.54½	1.54½	1.34¾
Steel Bars, Tidewater	**1.54½**	1.54½	1.44½	1.44½
Steel Bars, Pittsburgh	**1.40**	1.40	1.30	1.30
Tank Plates, Tidewater	**1.64½**	1.64½	1.54½	1.74½
Tank Plates, Pittsburgh	**1.50**	1.50	1.40	1.60
Beams, Tidewater	**1.64½**	1.64½	1.54½	1.74½
Beams, Pittsburgh	**1.50**	1.50	1.40	1.60
Angles, Tidewater	**1.64½**	1.64½	1.54½	1.74½
Angles, Pittsburgh	**1.50**	1.50	1.40	1.60
Skelp, Grooved Steel, Pittsburgh	**1.45**	1.45	1.40	1.50
Skelp, Sheared Steel, Pittsburgh	1.50	1.50	1.50	1.50
Sheets, No. 27, Pittsburgh	**2.20**	2.10	2.10	2.25
Barb Wire, Pittsburgh	**2.20**	2.20	2.15	2.45
Wire Nails, Pittsburgh	**1.75**	1.75	1.70	1.85
Cut Nails, Pittsburgh	**1.75**	1.75	1.70	1.90
METALS:				
Copper, New York	14.87½	14.87½	14.87½	12.37½
Spelter, St. Louis	**5.85**	5.70	5.55	4.65
Lead, New York	4.60	4.60	4.60	4.25
Lead, St. Louis	**4.55**	4.52½	4.40	4.17½
Tin, New York	29.35	29.00	29.80	28.60
Antimony, Hallett, New York	8.75	8.75	9.00	6.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	**3.74**	3.64	3.64	3.79

Chicago.

FISHER BUILDING, December 28, 1904.—(*By Telegraph.*)

The week under review is marked by a few unimportant advances in Pig Iron and Old Materials and by a general strength in quotations in spite of the fact that current business is light. Underneath the feeling of optimism and hopefulness lies a fear that the rapid rate at which prices have advanced and business has improved may have prejudiced the permanence of the improvement; in other words, that the growth was too rapid to be healthy. As against this it must be recorded that business being booked by foundries, machine builders, car shops and nearly all users of Iron and Steel in any form is improving steadily. The increased purchases of railroads, the large factory orders being executed by implement and vehicle plants, the activity in shipbuilding, the extensive contracts on the books of car and locomotive builders all combine to give to the producers of Pig Iron and Finished Iron and Steel a tonnage approximating their present capacity. The shortage of Coke, due to drought in the Coke regions, and the consequent curtailment of Iron production, are another bull factor, and the same drought is crippling many Steel works and reducing their normal output, which, of course, does not tend to relieve the situation. With advances made last week in Structural Steel, Plates, Bars and Black Sheets, and prospective advances in Wire, Pipe and Galvanized Sheets, the market prices of to-day are approaching those of two years ago, and everywhere there is the hope expressed that high prices may not be accompanied by the same shortage of materials, unsatisfactory mill deliveries and forced resort to importation. The last week of 1904 finds the trade in a very different frame of mind from the last week of the previous year. Now everything is tending upward, business improving and industries making preparations for realizing their maximum out-

puts, while a year ago curtailment and retrenchment were everywhere the order of the day.

Pig Iron.—Though the buying movement has been light during the last week owing to holiday interruptions and to approaching inventories, the tone is strong and prices have in some cases advanced sharply. More and more buyers are giving Northern Iron producers $17.50, and there is less and less tonnage offered at $17 for No. 2 Foundry. The strength of Irons in the Ohio districts is reflected in 50c. advances in the Chicago market on similar grades. Standard Bessemer is higher for the same reason, being 25c. higher than last week's quotations. The relatively small tonnage of Southern Iron in the hands of consumers in proportion to the lower silicon Northern Iron has led to a demand for Softeners almost beyond the capacity of furnaces to supply. Silvery Irons have therefore advanced strongly, the Southern Silveries being 50c. to $1 higher and Jackson County and Kentucky Silveries $1.50 to $2 higher than quoted last week. We quote:

Lake Superior Charcoal	$18.50 to $19.00
Northern Coke Foundry, No. 1	17.50 to 18.00
Northern Coke Foundry, No. 2	17.00 to 17.50
Northern Coke Foundry, No. 3	16.50 to 17.00
Northern Scotch, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 1	19.30 to 19.80
Ohio Strong Softeners, No. 2	18.80 to 19.30
Southern Silvery, 4 to 6 per cent. Silicon	18.65 to 19.65
Southern Coke, No. 1	.... to 17.65
Southern Coke, No. 2	.... to 17.15
Southern Coke, No. 3	.... to 16.65
Southern Coke, No. 4	.... to 16.40
Southern Coke, No. 1 Soft	.... to 17.65
Southern Coke, No. 2 Soft	.... to 17.15
Southern Gray Forge	.... to 16.50
Southern Mottled and White	.... to 15.90
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	18.50 to 19.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	21.30 to 22.30
Jackson County and Kentucky Silvery, 10 per cent. Silicon	.... to 23.30
Alabama Basic	.... to 17.15
Virginia Basic	.... to 17.15

Billets.—While official prices on Open Hearth Steel Billets are $26, Chicago, for Sections 16 square inches up to but not including 100 square inches and $28 for Billets larger than 100 square inches and smaller than 16 square inches, the actual price being paid in this market by forge shops ranges from $1.50 to $2.50 higher. Bessemer Billets, which are officially $24 for base sizes and $26 for sizes larger and smaller than base, are also held at a premium. The same is true of Sheet and Tin Plate Bars, and there is so little material available that it is extremely difficult to quote the going price.

Rails and Track Supplies.—No further large tonnages have been booked by the Illinois Steel Company from Western trunk lines, but there are a number of large deals which are expected to come up early in January. The abolition of the principle of equalizing freights is giving the Western mill a great strategic advantage which will soon fill its books with orders up to the full limit of its allotment. Light Rails are quoted at from $30 for 12-lb. Sections down to $24 for the 30-lb. Sections. Angle Bars are strong at 1.30c. to 1.35c.; Spikes at 1.70c. to 1.75c.; Track Bolts at from 2.30c. to 2.45c., base, with Squre Nuts, and 15c. extra for Hexagon Nuts. Store prices on Bolt Supplies and Spikes range from 15c. to 20c. higner than mill prices.

Structural Materials.—But small trading is being done for immediate delivery, but heavy tonnages are being booked for the first and second quarters of next year on the following basis: Beams and Channels, 3 to 15 inches, inclusive, 1.66½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.66½c.; Angles, larger than 6 inches on one or both legs, 1.76½c.; Beams, larger than 15 inches, 1.76½c.; Zees, 3 inches and over, 1.66½c.; Tees, 3 inches and over, 1.71½c., with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Local jobbers have been unable to advance their prices more than 10c. above those formerly prevailing, making the minimum price on Angles, Beams and Channels, 1.90c., with 10c. advance for 18, 20 and 24 inch Beams and for Angles larger than 6 inches on one or both legs. These prices are for either random lengths or cut to lengths, but 10c. to 15c. higher is charged for very small or wasteful odds.

Plates.—Evidently the advance made December 20 is looked upon by the trade as being only the first step in an effort to restore the old 1.60c. price, and for that reason buyers are actively covering their requirements. Official prices at Chicago for shipment from mill in car lots are: Tank quality, ¼-inch and heavier, wider than 24 and up to 100 inches wide, carloads, Chicago, 1.66½c.; 3-16 inch, 1.76½c.; Nos. 7 and 8 gauge, 1.81½c.; No. 9, 1.91½c.; Tank quality, 24 inches wide and narrower, 10c. below these prices; Flange quality, any width up to 100 inches, 1.76½c.; Sketch Plates, in Tank quality, 1.76½c.; in Flange quality, 1.86½c. Store prices on Plates are as follows: Tank Plates, up to 100 inches wide, ¼-inch and heavier, 1.90c. to 2c.; 3-16 inch up to 72 inches wide, 2c. to 2.10c.; No. 8, up to 60 inches wide, 2c. to 2.10c.; lower gauges are quoted under the headings of Sheets. Beyond the base widths named extras from 10c. to 25c. per 100 lbs. are charged for wider widths; Flange quality is usually charged at 25c. extra.

Sheets.—Blue Annealed Sheets, No. 16 gauge and heavier, have been advanced $1 a ton, while Box Annealed Sheets, No. 18 gauge and lighter, have advanced $6 a ton. This month the new prices at Chicago for shipment from mill in car lots are as follows: Nos. 9 and 10, 1.81½c.; Nos. 11 and 12, 1.86½c.; Nos. 13 and 14, 1.91½c.; Nos. 15 and 16, 1.96½c.; Nos. 18 and 20, 2.21½c.; Nos. 22 and 24, 2.26½c.; Nos. 25 and 26, 2.31½c.; No. 27, 2.36½c.; No. 28, 2.46½c.; No. 29, 2.61½c.; No. 30, 2.71½c. Large jobbers have advanced their secheduled of prices as follows: Blue Annealed Sheets, No. 10, 2.05c. to 2.15c.; No. 12, 2.10c. to 2.20c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Nos. 18 and 20, 2.45c. to 2.50c.; Nos. 22 and 24, 2.50c. to 2.60c.; No. 26, 2.55c. to 2.65c.; No. 27, 2.60c. to 2.70c.; No. 28, 2.70c. to 2.80c. Galvanized Sheets, while not officially advanced, rule higher in tone and in some instances the prices have been advanced. The official prices remain as follows, f.o.b. Chicago, in car lots: No. 16, 2.61½c.; Nos. 18 and 20, 2.76½c.; Nos. 22 and 24, 2.91½c.; No. 26, 3.11½c.; No. 27, 3.31½c.; No. 28, 3.51½c. These prices range from 75, 10 and 10 at Pittsburgh in the heavier gauges to 80 and 2½ in the lighter. Store discounts range as follows, f.o.b. Chicago, warehouse: Nos. 10, 12 and 14, 75 per cent. to 70 and 10; No. 15, 75 and 2½ to 70, 10 and 5; Nos. 18 and 20, 75 and 7½ to 75; No. 22 and lighter up to 36 inches wide at 75 and 10 to 75 and 2½; all Sheets more than 36 inches wide in any gauge are held at a minimum of 70 and 10 and range from there to 70 and 5 discount.

Bars.—Official reports received too late for publication in last week's issue were to the effect that the meeting of December 20, which raised the price of Bessemer Bars $2 a ton, at the same time eliminated the former differential between Bessemer and Open Hearth by advancing Open Hearth Bars only $1, the car lot price for both classes of Bars being set at 1.40c., base, half card extras at Pittsburgh and 1.45c., base, for less than car lots. This makes the new car lot price 1.66½c. at Chicago, with 1.71½c. for less than car lots. Quantity differentials are added to the regular extras for size and for less than car lots, as follows: Less than 2000 lbs. down to 1000 lbs. of a size 10c. extra; less than 1000 lbs. of a size 30c. extra. At that price the consumer can buy small lots much cheaper from store than from mill, as the store price is still held at a minimum of 1.75c., Chicago, plus half card extras. Iron Bars are strong at 1.65c., base, half extras, in car lots from mill, and 1.85c., base, full extras, in round lots from store, ranging up to 2c. in very small lots. The same quantity differentials from mill prevail in Iron Bars as in Steel. Iron and Steel Bands take the same prices from mill and store as Iron and Steel Bars. Soft Steel Hoops are unchanged at 1.71½c. rates, full extras, Chicago, in car lots. Soft Steel Angles, Channels, Tees and Shapes are quoted 10c. above Bars, or 1.76½c., Chicago, in car lots, with half card extras.

Merchant Steel.—Price advances forecast last week were correct, except in the case of Open Hearth Spring Steel, which is being held at 2c., Chicago, to the general trade. Other prices, based on the new Bar schedule of December 20, are: Smooth Finished Machinery Steel, 1.81½c.; Smooth Finished Tire, 1.76½c.; Flat Sleigh Shoe, 1.61½c.; Concave and Convex Sleigh Shoe, 1.76½c.; Cutter Shoe, 2.30c.; Toe Calk Steel, 2.11½c.; Railway Spring, 1.76½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up. Shafting is unchanged for the present at 52 per cent. discount in car lots and 47 per cent. in less than car lots in base territory.

Merchant Pipe.—The trade is expecting an advance in price early in January. Just how soon this will come, if it comes at all, is a matter of guesswork. Meanwhile orders continue to come in with more than usual activity for this time of year. Official prices named by the leading producers to consumers for shipment from mill are as follows, at Chicago:

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ to ¼ inch	67.35	51.35	65.35	49.35
⅜ to ½ inch	71.35	59.35	69.35	57.35
7 to 12 inches	70.35	55.35	68.35	53.35
Extra strong, plain ends, ⅛ to ⅜ inch	60.35	48.35	58.35	46.35
⅛ to 4 inches	67.35	55.35	65.35	53.35
4½ to 8 inches	63.35	51.35	61.35	49.35
Double extra strong, plain ends, ⅛ to 8 inches	56.35	45.35	54.35	43.35

Boiler Tubes.—Official less than car lot prices on Boiler Tubes are unchanged at the following figures:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches	44.35	41.35	52.35
1¾ to 2¼ inches	56.35	41.35	40.35
2½ inches	58.35	46.35	43.35
2¾ to 5 inches	64.35	53.35	up to 4 in. 50.85
6 to 13 inches	56.35	41.35	....

While the car lot discount is officially only two points better, actual business is being transacted with independent mills at the following basis for car lots, Chicago:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches	50	42	55
1¾ to 2¼ inches	62	45	48
2½ inches	64	50	49
2¾ to 5 inches	70	57½	52½

The same price can be obtained at mill in less than car lots, in some cases with a small freight allowance subtracted. Store prices on Boiler Tubes are fairly well maintained:

	Steel.	Iron.	Seamless Steel.
1 to 1¼ inches	42½	37½	40
1¾ to 2¼ inches	52½	35	37½
2½ inches	55	37½	40
2¾ to 5 inches	62½	47½	47½
6 inches and larger	52½	..	..

Cast Iron Pipe.—Nothing of moment has happened in this market, and although this is normally a dull season of the year, when prices are apt to be weak, great stregnth is given to prices by the constantly advancing cost of Pig Iron. Prices are unchanged, as follows: $28.50 a gross ton for 4-inch Water Pipe and $27.50 for 6-inch and larger, with $1 extra for Gas Pipe.

Old Metals.—As the result of active bidding on the large tonnage offered by the Burlington and St. Paul roads last week the market has taken on a firmer tone, with several advances in price. The great activity of Western Open Hearth plants and the renewed life in the Iron and Steel business in general have tended to reduce dealers' stocks and to make it easy to believe that the market will continue to be an advancing one. We quote, per gross ton:

Old Iron Rails	$22.25 to $22.50
Old Steel Rails, 4 feet and over	16.50 to 17.00
Old Steel Rails, less than 4 feet	16.00 to 16.50
Heavy Relaying Rails, subject to inspection	22.50 to 23.00
Heavy Relaying Rails, for side tracks	20.00 to 20.50
Old Car Wheels	16.75 to 17.00
Heavy Melting Steel Scrap	15.00 to 15.50
Frogs, Switches and Guards	15.00 to 15.50
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$19.50 to $20.00
Iron Car Axles	23.00 to 23.50
Steel Car Axles	17.50 to 18.00
No. 1 Railroad Wrought	18.00 to 18.50
No. 2 Railroad Wrought	17.00 to 17.50
Shafting	17.50 to 18.00
No. 1 Dealers' Forge	14.00 to 14.50
Wrought Pipes and Flues	13.25 to 13.75
No. 1 Cut Busheling	12.50 to 13.00
Iron Axle Turnings	12.00 to 12.50
Soft Steel Axle Turnings	12.00 to 12.50
Machine Shop Turnings	11.25 to 11.75
Cast Borings	8.50 to 9.00
Mixed Borings, &c	8.50 to 9.00
No. 1 Mill	9.50 to 10.00
Country Sheet	8.50 to 9.00
No. 1 Boilers, cut to Sheets and Rings	13.00 to 13.50
No. 1 Cast Scrap	14.25 to 14.75
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	13.75 to 14.25
Agricultural Malleable	12.50 to 13.00

Metals.—Markets are not quite as strong as they have been, but the pause is a seasonable one, and after the holiday disturbances are over renewed strength is expected. The only change in prices is a 15c. advance in Spelter in car lots. Casting Copper is quoted at 15c. to 15⅛c. and Lake at 15¼c. to 15½c. Pig Lead is held at 4.60c. for 50-ton lots, 4.65c. for car lots and 4⅞c. to 5c. for small lots. Pig Tin is 30½c. to 31c. Spelter is 5.90c., with small lots selling at 6.25c. Sheet Zinc is 6.80c., Chicago, in car lots of 600-lb. casks, and ¼c. to ½c. higher for small lots. We quote Old Metals: Copper Wire and Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12½c.; Red Brass, 11¼c.; Red Brass Borings, 10c.; Yellow Brass, Heavy, 8¾c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7¼c.; Lead Pipe, 4.25c.; Tea Lead, 4.10c.; Zinc, 4½c.; Pewter, No. 1, 19½c.; Block Tin Pipe, 26c.

Coke.—Chicago is a low priced market for Coke just now, as compared with consuming centers further east. The low freight rate prevailing from operations along the Louisville & Nashville and the presence of the Solvay ovens at Milwaukee place the Chicago salesman between two fires. Furnace Coke from Pennsylvania and West Virginia fields ranges from $4.90 to $5.40 a ton at Chicago; Wise County, Va., Foundry Coke at $4.50 to $4.75. Furnace Coke, owing to heavy demand, is only 25c. lower than Foundry. Milwaukee Solvay is unchanged at $5.50 for immediate delivery in single car lots.

The American Shipbuilding Company, Cleveland, Ohio, has closed a contract with the Kelly Island Lime & Transport Company for a tug and two steel scows, to cost $150,000. The scows will be 180 feet over all and will carry 1500 tons. They will be fitted with steam appliances throughout. The tug, which will be of steel, will be 80 feet keel, 20 feet beam and 12 feet deep.

Cincinnati.

FIFTH AND MAIN STS., December 28, 1904.—(*By Telegraph.*)

Pig Iron.—The usual holiday lull is very apparent in the Iron market and there is practically little business being done. There are no inquiries of any size reported, larger consumers evidently preferring to remain passive until after the new year has been ushered in. There have been some sales made, however, but in no considerable tonnage, most of them averaging from a carload to 100 tons. Both the Northern and Southern productions are firm and strong. With the furnaces anticipating higher prices in the near future there may possibly be some Southern No. 2 that can be bought on a $13 Birmingham basis, but from what we can gather the ruling quotation is $13.50. Northern Irons have made no advancement so far as reported, and No. 2 is firm at $15.50 to $16, furnace. Gray Forge is still difficult to secure and the market for this grade is exceedingly strong. It is expected that with the coming in of January industries of all descriptions and classes will prove to be heavy purchasers, thereby increasing the consumption enormously. The situation as regards furnace Coke is still unsatisfactory and is a very important factor in present conditions. The Pipe interests are said to be very active, and while they have during the past few months secured a very large tonnage in various quantities and grades, the report is that they are still on the alert and willing to purchase whatever may appear desirable. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	.... to $16.75
Southern Coke, No. 2	.... to 16.25
Southern Coke, No. 3	.... to 15.75
Southern Coke, No. 4	.... to 15.50
Southern Coke, No. 1 Soft	.... to 16.75
Southern Coke, No. 2 Soft	.... to 16.25
Southern Coke, Gray Forge	.... to 15.25
Southern Coke, Mottled	$14.75 to 15.00
Ohio Silvery, No. 1	19.15 to 19.65
Lake Superior Coke, No. 1	17.15 to 17.65
Lake Superior Coke, No. 2	16.65 to 17.15
Lake Superior Coke, No. 3	16.15 to 16.65

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$18.50 to $19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—The supply is reported to be very short, with the tone of the market strong and demand on the increase. The labor situation plays a very important part just at this time, as fewer men are available at the ovens, owing to the holiday celebration. Prices are reported to be unchanged, the best grades of Connellsville Foundry Coke selling from $2.60 to $2.80, f.o.b. ovens.

Plates and Bars.—The dullness that is being felt by the Pig Iron trade is not in evidence so far as finished material is concerned. Agents report a very satisfactory inquiry, with conditions showing more strength daily. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.53c., with half extras; the same in smaller lots, 1.75c., with full extras; Base Angles, 1.63c., in carload lots; Beams and Channels, in carload lots, 1.63c.; Plates, ¼-inch and heavier, 1.63c., in carload lots; in smaller lots, 1.90c.; Sheets 16-gauge, in carload lots, 2.15c.; smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.73c., in carload lots.

Old Material.—The market is comparatively quiet for this class of Material and will probably continue so until the holiday season is over. Dealers are quite confident that a brisk market may be expected at this time, as all indications point this way. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $17 to $18 per net ton; No. 1 Cast Scrap, $14 to $14.50 per net ton; Iron Rails, $21.50 to $22 per gross ton; Steel Rails, rolling mill lengths, $14.50 to $15 per gross ton; Relaying Rails, 56-lbs. and upward, $23 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $15 to $16 per gross ton; Heavy Melting Scrap, $14.50 to $15 per gross ton; Low Phosphorus Scrap, $17 to $18 per gross ton.

The Milwaukee Coke & Gas Company, Milwaukee, Wis., has decided to increase the capacity of its plant by the addition of 40 ovens, and work on the new equipment will commence early in January. The company now has 80 ovens in operation, with an annual consumption of 240,000 tons of coal and an output of more than 100,000 tons of coke, besides making several million cubic feet of gas daily. The local demand is exceeding the supply, and the company is rapidly building up a large trade through all neighboring States. With the additional 40 ovens the daily output will be 800 tons, which it is estimated will be sufficient for the present.

Philadelphia.

FORREST BUILDING, December 27, 1904.

The past week has been a more general holiday than has been known for several years past, and the coming week is likely to be much of the same character. This implies nothing unfavorable as regards business, but the reverse. Makers of Pig Iron certainly do not want any more orders at the present time, while manufacturers of the more advanced products do not expect any. The first mentioned have probably 75 to 80 per cent. of their entire product sold for each week during the first half of 1905, so that they would rather take their chances for awhile longer than add to the responsibilities which they have already assumed. Manufacturers of Finished Material do not expect very much business, because buyers placed as many orders as possible before the advance in prices was announced, consequently there is nothing more to be expected now. Taking everything into account, therefore, the appearance of things is extremely satisfactory, more so in fact than the real situation warrants, for the reason that a large proportion of the first half of the year will be taken up in filling orders with little or no profit. The one gratifying feature is that business can be had in large volume, which leads to the conviction that the course of events has changed from restriction to expansion and from declining prices to advancing prices. It is of course impossible to define the extent of the improvement, but for the present it is pleasing to note the fact that the closing week of 1904 gives promise of great and increasing prosperity during the year whose advent will be celebrated within the next few days.

Pig Iron.—The market has a good deal of holiday appearance, although some large transactions were made during last week. These were chiefly for Steel making and include Basic at $16.50 and Low Phosphorus at $20.25 to $20.50, one 5000-ton lot of the latter having been taken at a figure not made known, but it is understood to be exceptionally low considering the general strength of the market. Foundry and Mill Irons are quiet, but the undertone is strong, and the chances for lower figures are not encouraging to those who wish to place orders. The chances seem to favor a brief period of dullness, and as there has been an abundance of rain, it is expected that the Coke situation will be much easier in course of the next two or three weeks. Meanwhile quotations for Philadelphia and nearby deliveries are firm as follows:

No. 1 X Foundry	$17.75 to $18.00
No. 2 X Foundry	17.25 to 17.75
No. 2 Plain	16.50 to 17.00
Standard Gray Forge	16.25 to 16.50
Ordinary Gray Forge	15.25 to 15.50
Basic	16.25 to 16.50
Low Phosphorus	20.25 to 20.50

Finished Material.—The market maintains all the strength it has had during the past few weeks, but at the advanced prices there will naturally be some slackening in the demand. Mills are very full of orders, however, and are expecting considerable new business after the turn of the year, so that on the whole prospects are unusually favorable. The new list of prices is as follows for Philadelphia delivery:

Plates.

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.63½	1.68½
Tank, Bridge and Boat Steel, rectangular plates, 14 inches wide and under	1.53½	1.58½
Flange or Boiler Steel	1.73½	1.78½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.83½	1.88½
Still Bottom Steel	1.93½	1.98½
Locomotive Fire Box Steel	2.13½	2.18½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8 B. W. G.	.15 "
No. 9 B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Beams and Channels, up to 15 inches	1.63½
Over 15 inches	1.73½
Small Angles	1.63½
Large Angles	1.73½
Steel Bars	1.63½
Refined Iron	1.63½ to 1.68½

Old Material.—Prices are very firm, but the demand is by no means urgent. Consumers regard the asking prices as too high, but holders seem more inclined to advance than reduce their figures, so that there is very little business doing unless on sellers' terms. Opinions vary in regard to the ultimate course of the market, but for the present bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails	$17.00 to $17.50
No. 1 Steel Scrap	16.25 to 16.75
Old Steel Axles	18.50 to 19.50
Old Iron Axles	23.50 to 24.00
Old Iron Rails	20.00 to 21.00
Old Car Wheels	15.00 to 15.50
Choice Scrap, R. R. No. 1 Wrought	19.50 to 20.00
No. 1 Yard Scrap	18.00 to 18.50
Machinery Scrap	15.00 to 15.50
Low Phosphorus Scrap	20.50 to 21.00
Wrought Iron Pipe	15.00 to 15.50
No. 1 Forge Fire Scrap	14.00 to 14.50
No. 2 Forge Fire Scrap, Ordinary	11.00 to 11.50
Wrought Turnings	12.75 to 13.25
Wrought Turnings, Choice Heavy	13.75 to 14.25
Cast Borings	10.00 to 10.50
Stove Plates	13.50 to 14.00

Pittsburgh.

PARK BUILDING, December 28, 1904.—(*By Telegraph.*)

Pig Iron.—It is stated positively that the United States Steel Corporation is inquiring for Bessemer Iron for January delivery, and will probably buy about the same tonnage for January shipment as it bought for December delivery, which was 25,000 tons. The price of this Iron will probably be $16, at Valley furnace, which is 50c. a ton higher than was paid for the December Iron. Inquiries for quite a tonnage of Bessemer, Basic and Malleable Bessemer Iron from Eastern consumers are in the market, and one sale of 3000 tons of standard Bessemer Iron has been made to a large Eastern Steel works for January, February and March delivery at $16, Valley furnace. Bessemer and Basic Iron for first quarter delivery is held at $16 minimum, Valley furnace, and a few sales of small lots for spot delivery have been made at $16.25, Valley furnace. Forge Iron is quiet in demand, but is firm at $15 to $15.50, Valley furnace. The large consumers of Forge Iron are pretty well covered for the next several months. There is only a fair inquiry for Foundry Iron, but the market is very firm on the basis of $16.50 to $16.75 for Northern No. 2, Valley furnace. We note a sale of 5000 tons of Bessemer and one of 1500 tons for first quarter delivery at $16, Valley furnace.

Steel.—The Steel market is quite active, and the Carnegie Steel Company is operating at the present time all its Steel plants, with the single exception of the Donora works, which contains 12 50-ton furnaces, and these will be started shortly after the Donora blast furnaces are put in operation and a supply of metal is secured. The official price of Steel does not cut much figure in the open market, as consumers of Billets, Sheet and Tin Bars who are not covered by sliding scale contracts have to pay from $1 to $2 a ton premium above official prices. It is a fact, however, that only a comparatively small tonnage of Billets and Bars is sold in the open market, as most leading consumers have running contracts based on the price of Pig Iron, by which they get their Billets and Bars at somewhat under official prices. These official prices are as follows: Bessemer and Open Hearth Billets, $21; Forging Billets, $23; Long Sheet and Tin Bars, $23, and Cut Bars, $23.50, all f.o.b. Pittsburgh, to which freight to destination is added.

(*By Mail.*)

In the past week the Pittsburgh district has been favored with some copious rains, which have been of much benefit to the manufacturing plants located along the Monongahela River and also to the Coke operators in the Connellsville region. The Monongahela River became so low and was so thoroughly impregnated with acids that the water corroded the boilers in manufacturing plants very quickly and prevented full operation of many works whose supply of water was short nearly all the time. The rains have also resulted in a Coal barge stage in the rivers and permitted the shipments of hundreds of thousands of tons of Coal to lower points, and this will bring a vast sum of money back to Pittsburgh, the effects of which will be very beneficial.

The Iron market has shown nothing of special interest during the past week. It is now the season of the year for stock taking, annual repairs and closing up the year's business, so that the situation is likely to continue somewhat quiet until after the first of the year. The whole market continues very strong, and prospects for the new year are exceedingly bright.

Sales of Pig Iron during the week have been fairly large, there being a good deal of inquiry for first quarter, and some business in Bessemer and Basic Iron for second quarter delivery is expected to be placed at an early date. The furnaces have not yet set a price on Bessemer and Basic Iron for second quarter delivery, but their ideas are $16.50 to $17, at furnace. For first quarter delivery the absolute minimum of the market on Bessemer and Basic Iron is $16, Valley furnace, but some sales for prompt delivery have been made at $16.25, and in one or two cases $16.50 is said to have been done. There is a moderate demand for Foundry Iron, and Northern brands of No. 2 are held at $16.50 to $16.75, at Valley furnace. Gray Forge Iron continues scarce, and there is a good deal of inquiry. Northern

makes are held at $15 to $15.50, Valley furnace, equal to $15.85 and $16.35, f.o.b. Pittsburgh. The Steel situation is very strong, and sales of Billets, Sheet and Tin Bars are being made at prices several dollars a ton higher than official figures. In fact, official prices on Steel no longer cut much figure in the market; nearly all sales being made are at a considerably higher basis.

In Finished Iron and Steel the only change in prices since our last report was an advance of $2 a ton on Black Sheets, $1 a square on Black Corrugated Roofing Sheets, $2 a square on Galvanized Corrugated Roofing Sheets, and 10c. a box in prices of Tin Plate. These advances were made by the American Sheet & Tin Plate Company on Thursday, December 22, and by the outside mills.

Ferromanganese.—There is a good deal of inquiry for Ferro and some fair sized sales have been made since our last report. The Carnegie Steel Company, which is the only maker of Ferro in the Pittsburgh district, is now operating all its Steel works to full capacity, and for this reason has very little Ferro to spare for the open market. We quote foreign and domestic Ferro at $43, delivered, for large lots, and 44 to $45 for small lots.

Wire Rods.—Demand for Wire Rods continues active and the market is very firm. We quote Bessemer and Open Hearth Rods at $30 to $31, Pittsburgh, and several sales of good sized lots are reported at the latter figure.

Skelp.—The Skelp mills are full of tonnage, some of them being filled up for the next three or four months. There is a good deal of inquiry in the market, and Pipe mills are having trouble in getting prompt deliveries of Skelp. Prices are very firm and we quote: Grooved Iron Skelp, 1.60c. to 1.65c.; Sheared, 1.65c. to 1.70c.; Grooved Steel Skelp, 1.45c. to 1.50c., and Sheared, 1.50c. to 1.55c. These prices are for ordinary widths and gauges, f.o.b. cars maker's mill, terms 30 days, less 2 per cent. for cash in 10 days.

Muck Bar.—There is a good deal of inquiry for Muck Bar and the market is very firm, owing to high prices and scarcity of Forge Iron. We quote best grades of Muck Bar at $28 to $28.50, Pittsburgh, and note that some makers are holding Muck Bar at $29 and refuse to shade that price.

Steel Rails.—The railroads are not coming into the market to place orders for Rails for 1905 delivery as fast as expected. We quote Standard Sections at $23, at mill. Demand for Light Rails continues active and the market is firm. The minimum price of the heavier sections is $23, and up to $26 for Light Sections.

Structural Material.—As a whole the market is quiet, quite a few jobs being held over until after the first of the year. Options were out on a good deal of work prior to the advance of $2 a ton, and some of these options will either have to be taken up within a very short time or they will expire. The only large contracts placed recently was one for 3000 tons of Steel for bridge work by the Pennsylvania lines West and taken by the American Bridge Company, also 5000 tons for bridge work placed by the Cincinnati, Hamilton & Dayton, and taken by the same interest. A good deal of work is expected to be given out very early in the new year. We quote: Beams and Channels, up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.50c.; Angles, 8 x 8 and 7 x 3½ inches, 1.60c.; Zees, 3-inch and larger, 1.50c.; Tees, 3-inch and larger, 1.55c. Under the Steel Bar Card Angles, Channels and Tees under 3-inch are 1.50c., base, for Bessemer, and 1.55c., base, for Open Hearth, subject to half extras on the Standard Steel Bar Card.

Plates.—Tonnage in Plates continues fairly satisfactory, but the mills could handle a good deal more work if they had it. The Steel Car interests are placing a fair tonnage of Plates and other Shapes, but the business from this source is not as large as expected. Prices as adopted at the meeting of the Plate mills on Tuesday, December 20, are as follows: Tank Plate, ¼-inch thick, 6¼ to 14 inches wide, 1.40c., base; over 14 inches wide and up to 100 inches in width, 1.50c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16 inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum, and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast not included.

Sheets.—On Thursday, December 22, the American Sheet & Tin Plate Company and the outside mills made an advance of $2 a ton in prices of Black Sheets, $1 a square on Painted Roofing Sheets and $2 a square on Galvanized Roofing Sheets. These advances in prices are due to the heavy demand for Sheets and the higher prices being paid by the mills for Sheet Bars. Demand for Sheets is very active and some of the mills are practically sold up for the next two months or longer. We have advanced prices $2 a ton on Black Sheets and now quote No. 24, box annealed, one pass through cold rolls, 2.05c.; No. 26, 2.15c.; No. 27, 2.20c., and No. 28, 2.30c We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c.; Nos. 25 and 26, 2.95c.; No. 27, 3.13c.; No. 28, 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.85 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—The advance of $2 a ton on Bessemer Bars and $1 a ton on Open Hearth was noted in this report last week. Prior to this advance in prices large consumers bought heavily, and the mills have more tonnage on their books at the present time for Steel Bars than at any time in the past year. Specifications on old contracts are coming in very satisfactorily and the outlook is regarded as very bright. Tonnage in Iron Bars is quite heavy, and Republic Iron & Steel Company now quotes Iron Bars at 1.65c., Youngstown, or 1.69¾c., Pittsburgh. We quote Bessemer and Open Hearth Steel Bars at 1.40c., base, for carload lots, with the usual advances for small lots.

Hoops and Bands.—We continue to quote Steel Hoops at 1.55c., but an advance in these is expected by the trade at any time. We quote Steel Bands at 1.40c., base, extras as per Steel Card.

Tin Plate.—On Thursday, December 22, the American Sheet & Tin Plate Company and the outside leading mills made an advance of 10c. a box in Tin Plate, effective on that date. The advance is the natural outcome of the heavy demand which has characterized the market for some time and also of the higher prices being paid by the mills for Tin Bars. We understand a very heavy tonnage of Tin Plate has been booked by the mills for delivery in first three months of next year, and also that some orders have been placed by the leading Can interests for delivery through first half of next year. This Plate is now being made and will be stocked until the buyers are ready for it. We have advanced prices 10c. a box, and now quote 100-lb. Cokes at $3.50 net, f.o.b. Pittsburgh, terms 30 days or 2 per cent. off for cash in ten days.

Merchant Pipe.—As yet none of the large orders for Line Pipe referred to in this report last week has been placed, but the inquiry of the Ohio Fuel Supply Company for 100 miles of 16 to 20 inch Line Pipe is likely to be given out this week. The Pipe mills are full of tonnage, and one or two concerns are practically out of the market for the next two months. Prices are very firm, there being almost an entire absence of any cutting. Discounts in carload lots to consumers are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	69	53	67	51
⅜ and ½ inch	73	61	71	59
¾ to 6 inches	77	67	75½	65½
7 to 12 inches	72	57	70½	55
Extra strong, plain ends, ⅛ to ⅜ inch	62	50	60	48
½ to 4 inches	69	57	67	55
4½ to 8 inches	65	53	63	51
Double extra strong, plain ends, ⅛ to 8 inches	58	47	56	45

Boiler Tubes.—Demand is quite heavy for this season of the year and the tone of the market is firmer than for some time. Discounts to consumers in small lots are as follows:

Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	46	43
1¾ to 2¼ inches	58	43
2½ inches	60	48
2¾ to 5 inches	66	55
6 to 13 inches	58	43

Discounts on Boiler Tubes in carload lots are two points lower than the above.

Merchant Steel.—Following the advance of $2 a ton in price of Steel Bars, prices of certain grades of Merchant Steel have been advanced the same amount. Tonnage for some time has been quite heavy, the trade placing liberal orders in view of the expected advance in prices. We quote: Tire Steel, 1.60c. to 1.65c.; Open Hearth Spring Steel, 2c. to 2.10c., depending on order; Smooth Finished Machinery Steel, 1.60c.; Toe Calk Steel, 1.95c. to 2c. The Shafting Association reaffirmed prices on the basis of 52 per cent. off

in carloads and 47 per cent. in less than carloads, delivered in base territory.

Spelter.—The market continues very quiet and prices are easier. We quote prime grades of Western Spelter for spot delivery at 5.78½c. to 5.83½c., Pittsburgh, but on a firm offer and for large lots this price would probably be shaded.

Connellsville Coke.—The heavy rains of the past week have been of great benefit to the Coke trade, as they insure an ample supply of water for some time to come. The Coke makers will now be able to get out a normal product, and hold out the hope that the railroads will be able to furnish sufficient cars to ship it. Demand for both Furnace and Foundry Coke is very active, best grades of Connellsville Furnace Coke being held at $2.15 to $2.25 a ton and 72-hour Foundry at $2.35 to $2.50 a ton at oven. Contracts for both Furnace and Foundry Coke have been made in the past week on the basis of $2.15 for Furnace and $2.35 for Foundry for shipment over first six months of next year. Furnace Coke for spot shipment is scarce and has sold as high as $2.35 to $2.45 per ton at oven.

Iron and Steel Scrap.—We note a large demand for Heavy Melting Scrap, a leading interest having bought several round lots in the past week on the basis of $16.50, Pittsburgh. General demand for Scrap is fair, but a good many consumers are holding off placing contracts until after the first of the year. Prices are very firm and some dealers are disposed to hold their Scrap for still higher figures. We quote: Heavy Melting Stock, $16.50 to $17, gross tons; No. 1 Wrought Scrap, $17 to $17.50, net tons; Busheling Scrap, $15.50, net tons; Cast Iron Borings, $11, gross tons; Wrought Turnings, $13.50, gross tons; Bundled Sheet Scrap, $13.75 to $14, gross tons; Iron Axles, $24, gross tons; Steel Axles, $13, gross tons; Steel Rails, $16.50 to $17, gross tons; Long Pieces, $17, gross tons.

Birmingham.

BIRMINGHAM, ALA., December 24, 1904.

If inquiry be taken as a standard of interest in the market, there is a good deal of it being manifested for the season of the year, but the transactions are limited. As stated in previous letters, the limitation of business results from the action of the furnace interests, whose inability to care for the tonnage demanded leads to the turning down of proffered orders. Occasionally a tempting order is offered and accepted, but these orders are generally at the top notch price of the market. There is no uniform price for the various grades and every seller makes his own price.

Quotations as given in these letters have been received with incredulity, but they are based on solid facts and actual transactions. For instance, last week there were sales of two lots of Gray Forge, 1500 tons each, at $12.50, furnace make, delivery January and February. Those sales bind the seller only in case he makes it. But the price paid goes the rounds of the buying markets. The conditions are omitted, and a wrong impression is created of the market values. At the time these sales were made there were sales of that grade at $12.75, and more wanted than was supplied. It is again stated that it is difficult to buy any Iron below top notch prices. There is not a particle of anxiety to make sales and the further off the delivery the less is the inclination. There were a few sales during the week on the basis of $13.50 for No. 2 Foundry, but they were made, one might say, to selected customers whom the sellers felt bound to favor. The majority of the sales were on the basis of $13.75 for No. 2 Foundry. Some of the sales are going to the Pittsburgh district.

During the week there were some inquiries for lots of Iron running from 5000 to 15,000 tons but they were not plentiful. The pruning knife was used mercilessly and wants were very materially cut down. One party who was an anxious buyer had his order trimmed from 15,000 to 3000 tons. Another buyer wanted 3000 tons and got 300 tons. Other instances could be cited to show how orders are being trimmed so that distributing shall be as wide as possible. There was one sale on the basis of $14 for No. 2 Foundry. The seller was out of the market and named what he intended to be a prohibitive price. To his surprise it was promptly accepted. This confirms what has been said before, and that is that with some it is just now more a question of getting the Iron than the price they have to pay.

It is a singular fact that the Ironmasters are in dread of a runaway market on or before the advent of early spring. They are perfectly satisfied with the prevalent values of Iron, and every single one of the fold is opposed to any further advance. If we could in the near future show a material increase in the output it would put to flight such fears. But the Ironmasters know that that is a doubtful proposition, and a rush of buying when stocks are nominal can have but one effect. Warning is again given buyers that there will be delays in delivery of purchases during the first quarter of the coming year. From the present condition of affairs nothing else can result.

Mention was made last week of the order secured by the Dimmick Pipe Company from the city of Muscatine, Iowa. This is supplemented this week by the receipt of a contract by the United States Cast Iron Pipe Company from the city of Montgomery, Ala., of 42 miles of pipe running from 2 inches up. Besides that, the same company has been shipping large consignments of Pipe to the Isthmus of Panama. Such a season of business prosperity the Pipe works have never before enjoyed. So sorely are they pushed on completing their orders that they will not take "Christmas off" holiday, as is usual, but will limit their celebration to one day. The same can be said of our rolling mills, which are now full of business, with rush orders filling a prominent place. The time usually given up to Christmas celebration will be materially lessened this year in the industrial world here.

The firm of Hardie-Tynes here secured the order from Montgomery for an air compressor at about $10,000.

Some gossip has followed the sale of the Alabama Consolidated Coal & Iron Company, but so far no information has been imparted to the public as to the identity of the purchasers or the value put upon the plant. The president of the company announces that the buyers of the controlling interest are New York parties, and furthermore sayeth not, except that the sale brings broad experience in business affairs and plenty of capital to reach successful results from their undertakings.

There is some gossip concerning the Woodstock Furnaces at Anniston, but nothing definite.

Litigation has set in about the Palos Coal mines, lately sold by order of court, and they may be held up for some time. The Yolande Coal & Coke Company bids fair to be a factor in the Coal trade of the district. The company commenced sinking its slope in September and is now getting out enough Coal to pay running expenses of the open mine, a result that speaks well for what is to come.

A rumor has become public that Cudahy, the pork packer, is in the market for 100,000 tons of Coal to be delivered during the coming year to supply various plants that he is to establish on the coast of Alabama and Mississippi. He is taking time by the forelock.

The sale of the O'Brien Opera House the past week was an important deal. The price paid was $125,000 cash, and the *quid nuncs* are on the *qui vive* as to what will be done with it. But a few years ago it sold for $60,000.

Cleveland.

CLEVELAND, OHIO, December 27, 1904.

Iron Ore.—During the past week or ten days some consumers have been making inquiries in an effort to cover their needs for the coming year. The producers have been cautious, however, and have not been willing to make any sales until conditions shape themselves further. One of the conservative Ore producers makes the estimate that prices for the coming year will be about 60c. a ton higher than they were last year. Some small sales have been made on that basis. The authority referred to gives the following as a possible basis for prices as the market stands at present: Bessemer Old Range, $3.75 to $3.95, f.o.b. Lake Erie ports; Mesaba Bessemer, $3.50 to $3.60; Old Range non-Bessemer, $3.20 to $3.30; Mesaba non-Bessemer, $3 to $3.10. It will be noted by these prices that there is not the usual differential between the Old Range and the Mesaba Ores. The differential may not be so great in future, since under the former difference in price the tendency has been toward a more liberal use of Mesaba Ores, which has enabled Mesaba producers to get a larger percentage of the business than the Old Range producers think warranted. This question comes into consideration in connection with the talk of the re-formation of the Ore Association. Upon this one ground alone the Ore producers expect that it will be impossible to revive the association. The prices quoted on Ore are on the base quality, which for the Old Range Ores is 63 per cent. Iron, 10 per cent. moisture and 0.045 in phosphorus for Bessemer and 60 per cent. Iron and 12 per cent. moisture for non-Bessemer. There is such a variation in the Ore as to the amount of Iron, moisture and phosphorus contained that the base quality alone is quotable. A variation in either Iron, moisture or phosphorus changes the value. Estimates have been made as to the amount of Ore on Lake Erie docks on December 1. While these figures are not exactly accurate and may not be available for a week, the estimate is of about 5,500,000 gross tons on dock, against 6,371,085 tons on December 1 last year, which will show a falling off of something over 700,000 tons. No statement is made of the amount of Ore on furnace stock piles at the present time, and with that item eliminated it is impossible to get at the amount of Ore which the furnaces will have available during the winter. As last year's Ore supply on Lake Erie docks proved much in excess of the needs, and since it is reasonable to suppose the furnaces have a normal supply on docks this year, there is nothing to argue a shortage for this winter, even with the increased melt of the furnaces over that which was seen a year ago.

Pig Iron.—The drought in the coking region, which was broken on Sunday and Monday, will be one of the principal factors in the Pig Iron situation for the immediate future. It is too early for the rains to have affected the Coke market, and consequently too early for any effect to have been felt in the Pig Iron trade, but there is a slightly easier tone on account of the changed conditions. The Coke prices have held at top figures, which are $2.75, at the oven, for 72-hour Foundry Coke, and $2.50, at the oven, for Furnace Coke. The car shortage, which is beginning to be felt in this territory, also has a good deal to do with the prices on Coke. There is not much change in the Pig Iron situation. The furnaces are well sold up on Foundry for the first three months of next year and have only small lots of which to make disposition. Small sales are still being made at $16, in the Valleys, with some sales at $16.50 to $17. A few sales of Basic have been reported, some prices working as high as $16, but for the most part the market holds steady at $15.50, at Valley furnace.

Finished Iron and Steel.—In some quarters purchases are being advised even at the higher prices, in anticipation of another advance later on by which the staples will be returned to the same level of prices as that from which they were scaled down earlier in the year. This is especially urged in view of the condition of some of the mills which are well sold up. In this connection considerable capital is made out of the fact that some mills in the valleys are closed through labor difficulties, thus restricting the output. The Bar Iron situation is still stiff, due to the high price of Scrap. The mills did not meet with much success last week in their efforts to break the market, and while the prices seemed to weaken under the assault they stiffened later in the week. That kept Bar Iron prices up to top notch, and while not much business has been done the quotation is still 1.65c., Youngstown. Not much buying of Bar Steel has been done on the new basis of prices. The specification on Plates and Shapes has been heavy, but new orders have been few. The Sheet trade is moderate with no fluctuations. Prices hold at 2.40c. out of stock for Nos. 22 and 24 Black Sheets as a basis, with the same gauges selling at 2.10c. in car lots at the mill. There is very little business in Rails. A fair demand is noted for Forging Billets, with prices holding $26.50 to $27, Cleveland.

Old Material.—The buyers, having failed to break prices, have bought sparingly, but dealers have been forced to hold their prices steady, whereas they had been contemplating a further advance. We continue to quote, all gross tons: Old Steel Rails, $15 to $16; Old Iron Rails, $25; Old Car Wheels, $17; Heavy Melting Steel, $16 to $17. All net tons: Cast Borings, $8; No. 1 Busheling, $14.50 to $15; No. 1 Railroad Wrought, $18 to $19; Iron Car Axles, $20 to $21 (nominal); No. 1 Cast, $14.50; Stove Plate, $11 to $12; Iron and Steel Turnings and Drillings, $12 to $12.50.

Cincinnati Machinery Market.

CINCINNATI, OHIO, December 23, 1904.

A review of the situation in machinery circles establishes the fact that what is generally termed the holiday season has thus far had very little effect on the industries in this city. Notwithstanding the fact that this season is usually considered to be given over wholly to preparations for the celebration of the yuletide festivities, and all manner of business is held in abeyance until the first of the new year, machine tool men as a general proposition avow that this year is an exception to the rule. The general prosperity of the country is very plainly indicated by the upward movement of pig iron, which is usually first to respond to the quickening influences, to be followed later by finished material in all its varied forms. Such at the present time is the situation among the machine tool builders, and most of them are well satisfied with trade, which is said to be above normal. Inquiries are developing from all sections of the country, while those from abroad have more than trebled during the past 60 days. The demand from Japan promises to continue for months, and, judging from reports, a number of shops of the city are very busily engaged in building tools that must be shipped at once. We are advised of a machine tool builder who has in the neighborhood of 200 tools that according to contract must be ready for delivery not later than January 10. This necessitates a large number of extra men, as well as running overtime. Taken as a whole, the demand from the Far East has been very opportune for concerns of this class, who generally have participated in the distribution of patronage. The foundry situation, while much improved, is still in evidence and is causing serious delays in obtaining the necessary castings required by machine tool builders generally. Another source of great annoyance is the matter of fuel supply. The Ohio River, over which most of the coal from Eastern points is forwarded to this city, is so low at the present time that transportation over this route had to be abandoned. While the fact remains that the many railroads centering in the city can do much toward helping the situation along this line, they are, however, unable to take the place of the waterway. This inability on the part of the railroads to fully control the situation is due for the most part to a vast shortage in equipment, as well as to a limited supply of motive power. This is further curtailed by the unprecedented drought that has prevailed for six months, and it has become necessary for the protection of their locomotives to haul water from creeks, one instance being known where the water supply was transported for nearly 100 miles. A change for the better in the matter of equipment is foreshadowed by the fact that contracts have recently been let for several millions' worth of rolling stock by the trunk lines, which, it is anticipated, will arrive and be placed in service in time to prevent the serious delays that have occurred for several consecutive years past.

Among the new structures that are now being erected is one for E. H. Huenefeld on Spring Grove avenue. This building will be five stories in hight, of brick and iron construction, and will be used for the manufacture of sheet metal specialties and similar goods. The building will cost $175,000 and, when completed, will be one of the largest of its class in the country. It has not been fully decided as to what new equipment will be necessary, as all the details have not been arranged. The plant will, however, require a 125 horse-power engine and boiler, for which inquiries are now being made. The factory will be completed some time in the spring, possibly by April.

The Hisey-Wolf Machine Company, which has occupied quarters on Elm street below Second, has found its present location too cramped and has secured the second floor of the new building being erected by the Oesterlein Machine Tool Company on Spring Grove avenue, expecting to remove about the middle of January, at which time it is anticipated the new home will be ready for occupancy. The company will install the tools it has at present and will increase these as necessity requires. It reports trade as excellent, the demand being so heavy that it has been found advisable to open an office in New York City. This office will be at 39 and 41 Cortlandt street and will be under the supervision of A. B. Bush.

The Oesterlein Machine Tool Company reports that if nothing intervenes to prevent it will move into its new quarters about the middle of next month. Trade is said to be fairly good, with inquiries more frequent.

The Lodge & Shipley Machine Tool Company is crowded with work, and, in conjunction with all of the lathe manufacturers of the city, is very well pleased with existing conditions. Both foreign and domestic demand is being manifested, and the feeling is strong that a general renewal and quickening is in process of formation that will be of some duration.

The D. T. Williams Valve Company, which was incorporated several weeks since, is very busy making arrangements for installing the new machinery which is expected to arrive the first of the week. A portion of this equipment was secured in this city and the remainder was purchased in the East. This machinery is all of the latest and most approved design, and as all of the patterns are completed, the company will soon be an aggressive force in the industries of the city. The building that it is remodeling is 100 by 191 feet and will accommodate 100 men. The company will manufacture a full line of valves, lubricators, oil and grease cups, &c.

The Cincinnati Milling Machine Company advises us that the month of December to date is the largest in its history and that it is crowded with orders. These are coming from both foreign and domestic sources, the foreign development being especially attractive and coming from sections that prior to this time had shown little inclination to purchase the company's tools. It is employing a larger force than ever, and while not yet working overtime, will probably be compelled to do so if present conditions continue.

The Bickford Drill & Tool Company is busily engaged in making preparations for the increased business anticipated after the holiday season is over. It reports a gradual increase in trade during the last 60 days from both home and abroad.

Houston, Stanwood & Gamble say that the month of December is far better from their point of view than the three months preceding. Inquiries are very promising from the South and West and also from the Pacific Coast, where a comparatively new field is opening for their machinery. They recently sold to the Mean & Fulton Iron Works, Birmingham, Ala., one of their 14 x 18 engines and a 16 x 60 boiler; to the Parr Lumber & Planing Mill Company, Clarks-

burg, W. Va., a 16 x 20 engine; a 20 x 24 engine for the Louisiana Cooperage Company, Plaquemine, La.: a large 20 x 24 engine for the Cincinnati Enquirer Company; one of their 13 x 18 twin engines with 16 x 60 boiler for Livingstone, Texas, and a 16 x 20 engine for E. W. Dow & Co., Columbus, Ohio, for sawmill purposes.

Shop No. 2 of the Bullock Electric Company is now under roof and arrangements are being made for the placing of the tools that are to compose the equipment. The punch presses have been placed in position, but owing to serious delays the remainder of the machinery has not yet arrived. The company is crowded with work and has found it necessary to erect additional shop room. This will be done by enlarging the large machine shop No. 3 by the addition of another story, which will give about 125,000 more square feet of floor space. This shop is where the heavy type of machines are built in units ranging up to 10,000 kw. in size. Bids are now being taken, and the improvement will be commenced in a very short time. The final contracts for the new foundry building will be signed this week, at which time will begin the erection of the building, which will be 55 x 110 feet, four stories, of buff brick construction. This foundry will have a capacity of about 75 tons per day and will cost in the neighborhood of $60,000. Owing to the recent law passed in the State of Ohio changing the double liability to single, and which has proved so satisfactory to manufacturing interests in this State, the Bullock Electric Mfg. Company has reincorporated as the Bullock Electric Company. This obviates the necessity of paying taxes in the State of New Jersey. The capital stock is $2,500,000, of which $1,000,000 is common and the remainder 6 per cent. cumulative preferred. The directors of the new company are W. S. Rowe, J. S. Neave, J. W. Bullock, M. R. Waite and S. R. Burton. Trade is reported as heavier than ever before and the demand on the increase.

The I. & E. Greenwald Company, maker of engines and gears, says that the foundry portion of its business is now running smoothly, enabling required castings to be obtained. General trade is better than for a long time, and within the past month some very nice orders have been received for the heavier type of engines. The gear trade is also active, and, taken as a whole, is very satisfactory.

The New York Machinery Market.

NEW YORK, December 28, 1904.

"Christmas week" this year has proved no exception to the rule of former years, and the machinery trade was at low ebb so far as large orders were concerned, and the general run of small business kept up pretty well. Inquiry is very good, and the prospects of an active revival of good business early in the new year are now brighter than ever. Machinery merchants are giving their closest attention to the purchases of the Government, particularly as regards the Navy Department. The purchases being made by this branch of the service are of unusual importance at present to the machine tool trade. The Panama Canal Commission is also buying machinery in considerable quantities. Aside from that for which bids are advertised the Commission is forced to place in the open market rush orders for small amounts of machinery from time which in the aggregate foot up to a very creditable showing.

The purchases in behalf of the Japanese and Russian Governments continue on a fairly large scale. One of the largest orders placed in this connection last week called for 20 medium sized lathes, bought on Japanese account. A prominent machine tool merchant stated yesterday that within the last 60 days the lathe orders resulting from the war in the Far East placed in this country aggregate about 2100 machines. The Japs, he said, know just what they want, too, and are specifying the name of the builders of the desired tools in their orders.

Concerning power station equipment there are rumors afloat in the street to the effect that the Interborough Company will soon send out specifications for equipment for a substantial increase to the station at Fifty-ninth street and North River. We understand, in fact, that present plans contemplate the doubling in size of this statnon. This does not seem at all contrary to what might be expected in view of the large extensions to the Subway system now under way and projected. It is hinted that the steam turbine is to be given an opportunity in the extension to the station to operate in competition with the great reciprocating engines now working in the Fifty-ninth street power house. It is expected that the two great electrical power stations of he New York Central Railroad system at Port Morris and Yonkers will now be hastened toward completion. The foundations will be finished about February 1. Specifications will soon be issued for the complete equipment of eight rotary converter stations to be operated in connection with this system. Each station will contain a 25-ton hand traveling crane. Other materials to be purchased include piping and covering valves and the transformers, switching equipment, &c. Plans are now announced for the great new Grand Central Station. According to the plans filed by the railroad officials the new terminal will involve the use of an area of more than 19 city blocks between Forty-second and Fifty-seventh streets and Madison and Lexington avenues. Details of mechanical equipment are not yet perfected.

The engineering firm of J. G. White & Co., 49 Exchange place, New York, is to construct a $100,000 hydraulic plant for the Chittenden Power Company just outside of Rutland, Vt., the equipment for which has not yet been secured. The firm has several other smaller projects in hand for which considerable in the way of power machinery will be required. The London branch of J. G. White & Co. has secured a contract for the reconstruction for electric traction of the entire horse tramway system of Belfast, Ireland. This work will cost upward of $2,500,000, and will necessitate the purchase of large quantities of equipment. While purchases for the Belfast electrification scheme will probably be made for the most part on the other side, merchants in this country are likely to benefit by both the orders placed with their European branches and the main offices here.

No important contracts for machinery have been let by the Robb-Mumford Boiler Company, Amherst, N. S., for equipping its new plant at South Framingham, Mass. It will be remembered that the building, which is to be 150 x 300 feet, is to be equipped with electric traveling cranes and all modern appliances which constitute an up to date boiler shop. We understand that F. H. Keyes, general manager, who is located at the Boston office, 170 Summer street, will have in charge the construction and equipment of the new plant.

The manufacture of ornamental iron work is to be taken up by Chas. L. Pettit, 484-486 Water street, Norfolk, Va., iron and steel merchant, and he will be in the market shortly after the first of the year for the machinery necessary for the manufacture of iron stairways, fire escapes and grill work of all kinds.

It was stated in these columns a month or so ago that the Janson Steel & Iron Company, Oxford, N. J., would purchase considerable new machinery, and now that its plans have assumed more definite shape it is thought that orders will soon be placed. The company has decided to move its mills to Columbia, Pa., where a site for the new buildings has been secured. As soon as the buildings are ready for occupancy the company intends to install such of the present machinery as is modern, the balance needed being purchased new. The equipment for which the company will be in the market includes such machinery as boilers, engines, pumps, heaters, &c. The new plant will be started up with a force of 300 hands. The present works contains 16 puddling furnaces, three-trains of rolls and four heating furnaces, and has an annual capacity of 20,000 tons of bar iron and steel.

Without giving notice the Navy Department, Washington, has changed the form of proposals for material for the various navy yards. Heretofore the lists under each opening were bound together, but under the new scheme they are sent out in separate sheets, each sheet being numbered and having at the head the bureau for which the supplies printed on it are intended. While the new forms may save the Navy Department money and time, they have already been the cause of some little confusion to prospective bidders, who will have to exercise considerable care in order to get all the sheets covering their lines of manufacture. All the classes, however, are numbered consecutively as before, and this can be taken as a guide, provided the last sheet is not missing.

The following is a list of the machine tools for Portsmouth, Boston, New York, Norfolk, Pensacola, New Orleans and the Naval Academy at Annapolis, bids for which will be opened January 17:

Class 1. One single head, horizontal, bolt threading and nut tapping machine for threading and tapping from ⅜ to 2 inches.

Class 2. One 36-inch vertical drill press.

Class 3. One back geared, power hack saw to carry 24-inch blades and have a capacity of 8 x 15 inches.

Class 4. Ten down draft forges, one steel pressure blower and one exhauster.

Class 5. One 16-inch improved patent head engine lathe with 8-foot bed.

Class 6. One 6-inch slotting machine, fitted with individual electric drive, having actual stroke of 6½ inches, with quick return motion to cutter bar.

Class 7. One Cincinnati metal planer to plane 24 inches wide, 24 inches high and 6 feet long.

Class 8. One 20-inch upright drill press, with combination wheel and lever gear.

Class 9. One improved turret lathe.

Class 10. One 16-inch back gear crank shaper.

Class 11. One 20-inch engine lathe with 10-foot bed.

Class 12. One 18-inch improved type engine lathe with 8-foot bed.

Class 13. One 14-inch lathe with 8-foot bed.

Class 14. One universal milling machine.

Class 15. One universal saw bench.

Class 16. One automatic planer knife grinder.

Class 17. One electrically driven dry emery grinder.
Class 18. One 32-inch medium weight, motor driven automatic knife grinder.
Class 19. One single emery grinder.
Class 20. One motor driven pipe flanging and expanding machine, capacity 2 inches to 8 feet.
Class 21. One 5-head inside molding machine, capable of working stock 6 x 15 inches.
Class 22. One 2 x 24 inch flat head turret lathe.
Class 23. One straight side fly wheel power press.
Class 24. One light draft power launch.
Class 25. One motor drive outfit for Morgan combined punching and shearing machine No. 164.
Class 26. Two motor drive outfits for Morgan combined punching and shearing machines Nos. 162 and 163.
Class 27. One motor drive outfit for Ohl multible punch.
Class 28. One motor drive outfit for Ohl wire crimping machine.
Class 29. One motor drive outfit for Ohl rotary shear.
Class 30. One motor drive outfit for Ohl 10-foot power press.
Class 31. One motor drive for Niles plate straightening rolls.
Class 32. One 800-pound single frame steam hammer.
Class 33. One 12-inch tool room lathe with 5-foot bed.
Class 34. One 14-inch, back geared engine lathe with 6-foot bed.
Class 35. One 16-inch, back geared engine lathe with 8-foot bed.
Class 36. One motor driven polishing and buffing lathe.
Class 37. One double punch and shear, capable of punching up to ½-inch hole in ½-inch iron or shearing up to 1 inch round or 3 x ½-inch flat bar.
Class 38. One combination bench and slitting shear, two patent beading machines, one wiring machine, one setting down machine, &c.
Class 39. One motor driven drill press.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until January 10 for a quantity of supplies for the Portsmouth, Boston, Newport, New York, League Island, Annapolis, Washington, Norfolk, Charleston, Key West, Pensacola and New Orleans navy yards, including motors, forge equipments, spur gear cutters, core machines, pumps, &c.

The Bureau of Yards and Docks, Navy Department, on December 27 awarded the contract for the completion of the dry dock at the Mare Island Navy Yard, San Francisco, to the Scofield Company, Philadelphia, Pa. The amount of the contract is $1,385,000. The dry dock is to be completed in 33 months. This dry dock will be the largest in the United States Navy.

The following bids were opened December 20 for supplies for the various navy yards:

Pensacola, Key West and New Orleans.

Bidder 2. American Hoist and Derrick Company, St. Paul, Minn.
7. Brass Founders Supply Company, Newark, N. J.
9. H. Bomford Plumbing & Supply Company, Tampa, Fla.
11. George F. Blake Mfg. Company, New York.
14. Harry Channon, Chicago, Ill.
17. Wm. Wirt Clark & Sons, Baltimore, Md.
21. M. T. Davidson, Brooklyn, N. Y.
27. New Jersey Foundry & Machine Company, New York.
28. Fairbanks, Morse & Co., Chicago, Ill.
29. Gibbons & Stream, New Orleans, La.
30. Richard W. Geldhart, New York.
33. Handlan-Buck Mfg. Company, St. Louis, Mo.
38. E. B. Kelley, New York.
40. Wm. H. C. Lee, New York.
42. Manhattan Supply Company, New York.
45. Municipal Engineering & Contracting Company, Chicago, Ill.
49. S. Obermayer Company, Cincinnati, Ohio.
50. J. Ed. Ogden Company, New York.
54. Platt Iron Works, Baltimore, Md.
55. J. W. Paxson & Co., Philadelphia, Pa.
57. Rumsey & Co., Limited, Seneca Falls, N. Y.
68. Woodward, Wight & Co., Limited, New Orleans, La.
74. Fox Bros. Company, New York.
79. Manning, Maxwell & Moore, New York.
85. J. J. Channon, Philadelphia, Pa.
91. Drew Machinery Agency, Manchester, N. H.

Class 18. Four brass foundry furnaces—Bidder 7, $229; 17, $229.07; 42, $240; 49, $255; 55, $285; 68, $274; 74, $271; 91, $207.

Class 19. Four diaphragm bilge pumps—Bidder 17, $212; 27, $78; 42, $79.60; 50, $64.80; 57, $58; 74, $61.56; 79, $54.96.

Class 20. One duplex boiler feed pump—Bidder 9, $72; 11, $60; 17, $54.99; 21, $100; 28, $53; 29, $73; 33, $62.50; 14, $65; 54, $51.70; 68, $57; 91, $74.

Class 21. Five duplex vertical steam pumps—Bidder 11, $240; 17, $280; 21, $280; 54, $749; 91, $280.

Class 22. One portable electrically driven centrifugal pump—Bidder 40, $1431; 57, $754.65.

Class 23. One concrete mixer—Bidder 14, $550; 17, $539.99 and $439.99; 30, $509.95; 38, $995; 42, $537; 45, $958; 68, $524; 74, $539; 79, $575; 91, $538 and $635.

Class 24. One double cylinder double friction drum hoisting engine—Bidder 2, $890; 9, $1281; 14, $1025; 17, $970; 27, $1023; 30, $933.90; 50, $980; 74, $734; 85, $1100; 91, $895.

Mare Island and Puget Sound.

Bidder 1. Alliance Machine Company, Alliance, Ohio.
2. Baldwin Locomotive Company, Philadelphia, Pa.
3. Caldwell Bros. Company, Seattle, Wash.
4. Compressed Air Machinery Company, San Francisco, Cal.
5. Henshaw-Buckley Company, San Francisco, Cal.
6. Ingersoll-Sergeant Drill Company, New York.
7. Erie Foundry Company, Erie, Pa.
8. Davenport Locomotive Works, Davenport, Iowa.
9. Lima Locomotive & Machine Company, Lima, Ohio.
10. Manning, Maxwell & Moore, New York.
11. Niles-Bement-Pond Company, New York.
12. H. K. Porter Company, Pittsburgh, Pa.
13. Rand Drill Company, New York.
14. William Sellers & Co., Incorporated, Philadelphia, Pa.
15. Vulcan Iron Works, Wilkesbarre, Pa.
16. Wm. H. Wood, Media, Pa.

Class 1. One compressed air locomotive, one air compressor, one receiver or reservoir, &c.—Bidder 2, $2220, conditional; 5, $7056; 6, $2475, item 2; $2300, item 2.

Class 2. One four-wheel coupled switching locomotive—Bidder 3, $4800; 8, $4800; 9, $3795; 12, $4185; 15, $4103.

Class 3. One 24-inch engine lathe, complete, and one 220-volt alternating current motor—Bidder 4, $1210.40; 5, $1340; 11, $1490.

Class 4. 4000-pound single frame steel hammer—Bidder 1, $3738; 3, $4642.50; 7, $3350; 10, $4350; 11, $4590; 14, $3420; 16, $4335.

Catalogues Wanted.—The Department of Mechanics of the University of Arizona, Tucson, Arizona, has started an indexed catalogue file, covering steam and gas engines, electro dynamic, hydraulic, mining and milling machinery, fittings and supplies, and also a collection of mechanical devices, machine parts, fittings and samples of supplies and materials of machine construction. The file and collection are to be used for purposes of instruction in mechanical and electrical subjects, and any contribution to either will be very welcome. Address Prof. E. M. Blake.

The Southern Timber & Mineral Land Company.—The charter members of the Southern Timber & Mineral Land Company of Nashville, Tenn., have effected an organization by electing A. M. Shook president, E. H. Hinton vice-president, S. A. Champion general manager, and A. W. Wills secretary and treasurer. The capital stock was fixed at $100,000. The board of directors consists of A. M. Shook, A. W. Wills, Benton McMillin, S. A. Champion, E. H. Hinton, John Allison and J. H. Moore. An Executive Committee was elected and is composed of S. A. Champion, chairman; A. M. Shook, E. H. Hinton, Benton McMillin and A. W. Wills.

Connellsville Coke Land Sold.—The H. C. Frick Coke Company, one of the constituent companies of the United States Steel Corporation, has purchased the Thompson tracts of undeveloped coal lands in the Connellsville region. These lands lie largely surrounded by the Frick properties. The area involved is 970 acres, of which about 900 acres are in the heart of the Connellsville region, while about 70 acres lie in the direction of the Klondyke district. It is understood that the price paid was on the basis of a little under $1000 per acre.

Electrification of the West Shore Railroad has been decided upon and President Newman has been authorized to make contracts for the preliminary work. Parts of the line will be equipped with electric motor trains within the next year. At convenient points the West Shore will be connected with the suburban trolley system which the Vanderbilts are developing in the central part of New York State.

The Determination of Sulphur in Steel by Evolution Methods.

BY GEORGE AUCHY.

Although it is a matter of common knowledge that in pig irons containing much combined carbon evolution methods fail to get all the sulphur on account of some of it combining with the carbon, yet the belief is equally widespread that in the case of high carbon steels the reverse of this is true, and the sulphur is completely evolved as sulphureted hydrogen, and evolution methods are therefore held to be accurate for high carbon steels, though not for pig irons of the same percentage of combined carbon. It is true that it is the almost universal practice of steel works laboratories in the West to standardize their iodine solutions by a standard steel, yet as far as the writer can judge this is done simply as a matter of convenience, and not with any idea of counteracting any error that might result from loss of sulphur as mercaptan compound. But in spite of the very general belief in the accuracy of evolution methods for high carbon steels, the writer's experience compels him to the opposite belief, and he begs to give some results which, if accurate, justify the conviction that in high carbon steels there is just as much loss of sulphur in evolution methods as there is in pig irons by such methods. Of the aqua regia results that he has obtained only those are given in the following table which were obtained with a blank or dummy test on a nearly carbonless low sulphur Swedish iron, in which the sulphur (0.004 per cent.) had been repeatedly determined by evolution instead of a blank on the reagents simply. The determinations were made in sets of three with a blank test to each set, as before stated, using the nearly carbonless and sulphurless Swedish iron for the blank:

No.	Carbon. Per cent.	Sulphur by evolution. Per cent.	Sulphur by aqua regia. Per cent.
6,188	1.09	0.037	0.048
6,189	1.12	0.031	0.046
6,190	0.96	0.020	0.038
7,224	1.03	0.029	0.044
6,716	1.24	0.036	0.049
6,944	0.525	0.019	0.025
6,823	0.455	0.030	0.040
6,943	0.525	0.029	0.037
7,221	0.050	0.031	0.039

When the iodine solution is standardized, as is usually done in the West, with the aid of a standard steel, then of course this error is eliminated in such cases where the sample happens to be about the same carbon as the standard steel used in standardizing the iodine solution. But obviously a better and surer method of correcting the error is to find by trial just what loss may be expected in high, medium and low carbon steels, respectively, and then correcting one's results accordingly, using iodine solution standardized in the regular way, and not by means of a standard steel. From the above table it will be seen that 1 per cent. carbon steels should have their sulphur results (by evolution) increased at least one-third, and 0.50 per cent. carbon steels should have their sulphur results increased one-fourth. Low carbon steels, of course, need no correction.

The question of course arises that if it be then true that in high carbon steels sulphur is lost by evolution methods, how is it that this fact is not generally known? Surely the many chemists working on steel have repeatedly tested their results by evolution and checked them by aqua regia tests! The only answer possible to this objection is that there must be some source of error in the aqua regia method for high carbon steels that brings results by that method also too low. That this is in fact the case is indicated in a recent paper by Ford and Willey. The next question then is, What is this source of error in the aqua regia method? While the writer believes that Ford and Willey are correct in their facts, he has to consider that aside from their important point of too quick solution, their effort at explanation (that commercial chemists are not skilled enough to use the aqua regia method successfully) is rather a feeble one. There must be some chemical reason for the low aqua regia results. Now, if we take the directions given by our greatest authority in iron and steel analysis—Blair—and read them over, we find them at every point to be models of careful precision, except perhaps one, where it is directed that the solution of high carbon steels may be hastened by the use of hydrochloric acid. Right here is perhaps the reason of the low results, and if so it would explain why chemists get correct results in pig irons by aqua regia, and low results in steels. In this laboratory no hydrochloric acid is used in dissolving the steels.

The evolution method commonly in use may be a little simplified and shortened by omitting the large dilution previous to acidification and titration. With the amount of sulphur found in steels it is entirely unnecessary to dilute largely in order to keep the sulphuretted hydrogen in solution, and therefore the absorption apportion may conveniently consist of a Fresenius nitrogen bulb, and the titration be made without removing the liquid from the nitrogen bulb, but of course in diluted form. But it is essential that the liquid be entirely cold when titrated, as otherwise too high results are obtained.

In the aqua regia method a precaution worth mentioning is to have barium chloride present in large excess in the hydrochloric acid used for washing the barium sulphate.

OBITUARY.

W. E. C. COXE died at Toledo, Ohio, December 17, after an illness of over a year. He was district representative of the Cambria Steel Company and the Boyd, Stickney Coal Company, and had lived in Toledo for the past 11 years. He was born in Philadelphia, June 12, 1837, was a graduate of the High School of his native city, and was a private of the Commonwealth Artillery of Pennsylvania during the Civil War. He was for some years associated with the Philadelphia & Reading Coal & Iron Company as manager of its iron manufacturing interests and subsequently with the Columbus & Hocking Coal & Iron Company. He is survived by four sons and two daughters.

JOHN GARRY, founder of the Garry Iron & Steel Company, Cleveland, Ohio, and at one time a prominent manufacturer of that city, died suddenly December 17 at his home in Plainfield, N. J.

W. FOREMAN COLLINS, vice-president and business manager of the *Western Electrician*, died suddenly of apoplexy, December 21, in Chicago. Though only 37 years old at his death, Mr. Collins had been engaged in electrical journalism 15 years, during which time he had also done much original work of value in an engineering way, having devised many improvements in motors and perfected many valuable features of electric railway equipment and practice.

CLAUDE W. CASE, Marquette, Mich., died December 25 in Chicago of pneumonia, aged 43 years. He was born in Michigan and lived there nearly all his life. His business interests were in the Newberry Furnace and the First National Bank of Marquette, of which he was vice-president.

ROBERT J. HUBBARD died December 19 at Cazenovia, N. Y., aged 74 years. He was born in Utica, N. Y., and was long interested in a number of business enterprises in Rome, N. Y., being a director of the Rome Brass & Copper Company, the Rome Tube Works and the Rome Metal Company.

The builders of the Harrisburg engine, the Harrisburg Foundry & Machine Works, are about to engage in the manufacture of a steam turbine, which will be known as the Fleming turbine. One of horizontal form and 300 horse-power capacity is now in process of construction at the works in Harrisburg, Pa., and will be used to drive a generator to carry the factory load. The turbine will not be put on the market until it has been thoroughly tried out in actual operation. It is mainly the joint design of Benjamin T. Allen, chief engineer, and Thomas Hall, chief designer of the Harrisburg shops. Types to operate both condensing and noncondensing will be made.

Condensing Machinery.

At a meeting of the Society of Engineers, held at the Royal United Service Institution, London, England, a paper was read on "Condensing Machinery," by William Edward Storey, of which the following is an abstract, as given in a recent issue of *Engineering:*

After briefly mentioning a few of the condensing engines constructed in the seventeenth and early eighteenth centuries, the author showed how the desire to economize steam resulted in Watt's comprehensive invention, which introduced the separate condenser in a form very little varied to this day. He observed that the jet condenser, from its simplicity, was almost exclusively used until the demand for pure feed water became imperative, and the surface condenser was introduced into steamships. The originating cause of the independent condenser was the high speed of modern reciprocating engines. A comparison of the relative advantages of different types of jet condensers shows the counter current condenser to be more efficient than the parallel current type, producing a better vacuum with reduced expenditure of power and smaller outlay for pumps. The barometric condenser, he observed, dispensed entirely with the air pump, and he gave particulars of a large installation of such condensers in Manchester. A similar condenser, invented by Weiss, uses the barometric principle in conjunction with a dry air pump. The design of water pump best suited for use with counter current condensers was stated to be the horizontal, in which type particular care has to be observed to prevent accumulation of air in the valve boxes.

The author observed that the best known types of the ejector condenser included those of Morton, Körting and Ledward, and they differed not greatly in principle, though considerably in detail. They are water jet pumps abstracting the air inductively. In most cases a pressure water supply is absolutely necessary for installations of this type of condenser.

The question of pure feed water was the genesis of the surface condenser, the oil separator or filter freeing the water of condensation from the only impurity likely to have ill effects upon the boiler. Jet condensers are more efficient, but cannot be applied in all cases. The author observed that the evaporative condenser enabled the advantages of surface condensation to be experienced where there was only sufficient water available for boiler feed purposes. Its chief drawback is the fouling of the cooling surface by sedimentary deposit.

Various attempts have been made to improve the efficiency of the tubular condenser by bringing the water and steam into closer contact. Wheeler uses an internal return tube for the cooling water. Paul blocks up the center of the condenser tube, forcing the water through an annulus and the steam through an outer annulus, thus minutely subdividing both bodies. A condenser with corrugated plates for cooling surface, the invention of a Swede, Ljungström, has the same object of breaking up the bodies of water and steam, and is capable of condensing 70 pounds of steam per square foot per hour. The saving in weight resulting from the use of one of these condensers in a torpedo boat was stated to be 77½ per cent. as compared with the tubular type of condenser. For tubular condensers the best arrangement for the tubes was stated to be the vertical, which gives better drainage for the water condensed on the surface and leaves the latter more efficient.

The author stated that air pump capacity varied for surface and jet condensers in about the ratio of 0.7 to 2 cubic feet per pound of steam per hour. Of vertical single acting types the Edwards pump is largely used. It is provided with only one set of valves—head valves—and the air and water enter the working barrel through ports. The form of the bottom end of the pump chamber causes the water to be violently injected into the barrel, carrying air with it, both to be discharged on the up stroke. A very similar pump was designed in 1845 by J. G. Bodmer, and later modifications employ the same principle of valveless suction end.

Slide valve air pumps, to be used dry, were referred to as becoming more common, having proved themselves efficient by wide application on the Continent. Two-stage dry air pumps are also being employed for high vacuum in connection with turbines. For the same class of duty vacuum augmenters are used by some makers. Parsons employs an auxiliary steam jet to compress the air on the suction side of the air pump.

The circulating pump best suited for constant duty under moderate lifts was said to be of the centrifugal type, but the author pointed out that reciprocating pumps were better for a varying load and high lifts. The cooling tower was referred to as enabling condensing plant to be utilized independently of any considerations of large natural water supply. Cooling towers effect their object by the evaporation of water of 75 to 90 per cent. of the weight of steam condensed and by heating the air in contact with the water in the towers.

Central condensing plants are used where many different units of steam engines are installed, and are generally operated by their own steam engines or by electric motors. At Deptford, condensing plant for 10,000 horsepower of engines is erected on the roof. It consists of cooling towers, surface condensers, air and circulating pumps, with their own high speed engines. In conclusion the author observed that the difficulties met with in dealing with condensers for winding and similar intermittently working engines had still largely to be solved, but were now receiving much attention.

Chimney Versus Mechanical Draft.

A chimney with natural draft will have a draft dependent upon its hight, the power of which will not vary except upon the rise or fall of the internal temperature. It has therefore no sucking power; in fact, the term suction in this connection is a fallacy. The chimney acts because the external air is heavier than the internal, and thus presses into the chimney by the only available opening—namely, that at the bottom, the furnace front. The pressure or intensity of the draft fixes the amount of fuel it is possible to burn on a given area of grate. It therefore becomes necessary, when it is desired to increase the steaming capacity of a boiler by increasing its coal consumption, to increase the intensity of the draft, and the only way in chimney draft is to increase the temperature of the gases passing up it or increase the hight of the chimney. The first method of course means a large amount of waste and is a very uneconomical arrangement; the second is expensive and unusual. A chimney stack 150 feet high will burn from 15 to 20 pounds of coal per square foot of grate area per hour under normal conditions, but in wet or foggy weather it will be very much less than this, as the wet air is lighter than the dry and thus produces less pressure at the furnace, the weight of water vapor being about half that of air. A fair average of temperature in the furnace is 2400 degrees F. and that of the escaping gases at the chimney, without economizers, 600 degrees F. This means that one-quarter of the total heat generated is sent up the chimney to waste. Thus on a 2000 horse-power plant almost 500 horse-power is going up the chimney per hour, and the coal bill necessary to sustain this will come to a big figure in the year. . . . It is not the author's contention, but it has become a well ascertained fact, that it is cheaper and better in every way to provide the necessary supply of air for burning fuel in steam boilers by mechanical means, and to take as much heat out of the hot gases after they have ceased to be in contact with the boiler itself before they are turned out into the atmosphere, than to do it in the older way, by utilizing a portion of the heat generated to create the necessary supply of air. This is the primary reason for using a mechanical means of moving the air. The heat previously necessary to create the draft by means of a chimney may now be employed usefully in other directions.—*London Engineering Review.*

Since November 1 the shipments of Lake Superior iron ore this year reached the extraordinary total of 3,569,432 gross tons, which is 2,303,232 tons, or 182 per cent., greater than was done last year.

New York.

NEW YORK, December 28, 1904.

Pig Iron.—Locally, only a moderate amount of business has been done in Foundry Iron. A plant in the Albany district has purchased 3000 tons of Forge Iron from a Buffalo furnace interest. Usually these requirements are covered in other sections. We quote for tidewater delivery on Northern Iron: $17.75 to $18 for No. 1 X Foundry, $17.25 to $17.50 for No. 2 X Foundry, and $16.75 to $17.25 for No. 2 Plain. Alabama and Tennessee Irons are quoted $17.50 to $17.75 for No. 1 Foundry and $17.25 to $17.50 for No. 2 Foundry.

Steel Rails.—As yet none of the additional large orders for the Eastern trunk lines have been placed, but the inquiries being heavy indicate a very large tonnage.

Cast Iron Pipe.—The contract for 2500 net tons placed by New York City on December 21 was awarded to a contractor who bid on the Pipe laid. The parties from whom the Pipe will be purchased have not been made public. On January 6 bids will be opened for 10,000 net tons of Pipe and 800 tons specials for the Brooklyn high pressure service. General business is quiet, as is usually the case at this season. Carload lots continue to be quoted at $26.50 per net ton for 6 to 10 inch, at tidewater.

Finished Iron and Steel.—The New York Central order for 12,000 tons of bridge construction referred to last week was placed with the Riter-Conley Mfg. Company, Pittsburgh, and the same railroad contracted for about 1000 tons of Steel poles with the McClintic-Marshall Construction Company, Pittsburgh. The Delaware & Lackawanna contract for 6000 tons of bridge work was secured by the McClintic-Marshall Construction Company and the Fort Pitt Bridge Company. The American Bridge Company received an order for 5000 tons of bridge work from the Cincinnati, Hamilton & Dayton Railroad. The Harriman lines are in the market for 14,000 tons of bridge work. Other railroad companies are understood to be rapidly completing arrangements involving the use of considerable quantities of Structural Material and the outlook in this direction is very encouraging. The building trade is still quiet, with not much prospect of an early resumption of activity. The Plate trade is doing much better than had been expected after the rush of orders preceding the recent advance in prices. The demand from consumers is not only satisfactory, but appears to be increasing. The quantities thus placed are not individually large, but the aggregate is very satisfactory. The Bar trade is only moderate, as the inventory season is at hand and large buyers are now out of the market. Prices are very firm, asking prices being again above the agreed prices. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.64½c. to 1.80c.; Tees, 1.69½c. to 1.80c.; Bulbs, Angles and Deck Beams, 1.74½c. to 1.85c.; Sheared Plates in carload lots, 1.64½c. to 1.75c. for Tank, 1.74½c. to 1.90c. for Flange, 1.84½c. to 2c. for Marine, 1.84½c. to 2.50c. for Fire Box, according to specification; refined Bar Iron, 1.64½c. to 1.69½c.; Soft Steel Bars, 1.54½c. to 1.64½c.

Old Material.—The usual holiday conditions are prevailing and the tonnage now going out is not large. Nevertheless consumers are making inquiries which indicate early activity, and prices are very firmly maintained. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$20.00 to $21.00
Old Steel Rails, rerolling lengths	16.50 to 17.50
Old Steel Rails, short pieces	15.50 to 16.50
Relaying Rails	20.00 to 21.00
Old Car Wheels	15.50 to 16.50
Old Iron Car Axles	22.00 to 23.00
Old Steel Car Axles	19.00 to 20.00
Heavy Steel Scrap	15.50 to 16.50
No. 1 Railroad Wrought Scrap	19.00 to 20.00
No. 1 Yard Wrought Scrap	17.50 to 18.50
Iron Track Scrap	17.00 to 18.00
Wrought Pipe	14.50 to 15.50
Ordinary Light Iron	10.50 to 11.50
Cast Borings	8.50 to 9.50
Wrought Turnings	11.00 to 12.00
No. 1 Machinery Cast	14.50 to 15.50
Stove Plate	11.50 to 12.50

The receipt is acknowledged of a combined diary and memorandum book for 1905 from C. W. Leavitt & Co., 15 Cortlandt street, New York, dealers in Iron, Manganese, Chrome and Copper Ores and Special Metals and Alloys.

Owing to the increasing importance of its oil fields in Indiana the Republic Iron & Steel Company has placed in charge of its oil properties and their development R. L. Simonton, who for the last two years has been general manager of rolling mills. This latter office has been abolished, and Mr. Simonton, who was selected for his new duties because of his expert knowledge of the oil industry, will devote his entire time to that branch of the company's business.

Metal Market.

NEW YORK, December 28, 1904.

Pig Tin.—Almost immediately after the collapse of prices which we noted last week influences were brought to bear again in London with the result that prices again took an upward turn. In this market values crept up slowly behind the lead of London, and at this writing prices are somewhat better than last week both here and abroad. The resumption of the upward movement doubtless had some basis for legitimacy through a slight increase in buying which set in as soon as prices fell. In all quarters of the trade, however, it is admitted that the actual increase of business does not begin to offer sufficient excuse to warrant the advance of prices which has taken place within a week. There is a disposition to attempt to wipe out any discount on future quotations, and to-day 29.35c. to 29.50c. is quoted for the metal at any delivery from spot to March. In London there is a discount of 10 shillings on futures, to-day's quotations being £134 10s. for spot and £134 for futures. The arrivals so far this month aggregate 2537 tons, while it is figured that 1885 tons are now afloat.

Copper.—Conditions are entirely unchanged from last week. Prices remain the same as quoted a week ago here, although in London there has been a rather stiff advance. Consumers are not showing any confidence in the market. Demand from the interior continues to be very slow. This market is quoted to-day as follows: Lake, 14.87½c. to 15.12½c.; Electrolytic, 14.75c. to 15.12½c.; Casting Copper, 14.50c. to 14.87½c. London prices have advanced to £60 15s. for spot and £68 2s. 6d. for futures. Best Selected has advanced £1, to £70 15s. At this writing exports show a total of but 16,107 tons, supporting the prediction of a comparatively small exportation this month.

Pig Lead.—A very moderate demand is noted in this market, but prices are firm and without change, owing to the limited shipments from the West. Spot Lead in New York is quoted at 4.60c. to 4.70c. The St. Louis market has advanced a shade and is quoted to-day at 4.55c. to 4.62½c., according to brand. The London market has recovered slightly and was quoted to-day at £12 15s., or 5s. above the price ruling at the date of our last report. The American Smelting & Refining Company still quotes on the basis of 4.60c. for "shipment" Desilverized in 50-ton lots.

Spelter.—The market is considerably firmer and some improvement in demand is to be noted. Spot Spelter was quoted to-day nominally at 6c. to 6.12½c. The St. Louis market has advanced to 5.85c. London cables show an advance, quoting £24 17s. 6d.

Antimony—Is very weak and considerably lower. Cookson's was quoted to-day at 9c. to 9.25c., Hallett's at 8.75c. to 9c., Japanese at 8c. to 8.25c. and other brands at 7.75c. to 8c.

Nickel.—About the usual amount of business is noted. Prices are quoted for large lots at 40c. to 45c., with smaller quantities ruling at 50c. to 60c.

Quicksilver.—The market remains firm and unchanged, flasks of 75 lbs. being quoted at $40. The London price is unchanged at £7 15s.

Tin Plates.—On Thursday of last week the American Sheet & Tin Plate Company advanced the base price of Tin Plates 10c. per box, making the quotation $3.74 per box for 14 x 20, 100-lb. Coke Plates, f.o.b. New York, or $3.55, f.o.b. Pittsburgh. This advance was not unexpected by the trade in view of the rising markets for the raw materials entering into the manufacture of Tin Plates. The demand for Plates continues active, and a number of the independent mills have been securing slight premiums over the official price for prompt shipments. It is understood that a very heavy tonnage in Tin Plates was booked by the leading mills at the rates recently ruling, for delivery in the first quarter of next year. The system of allowing rebates on the purchases of Tin Plate has, we are advised, been entirely abolished.

The drought which has been costing western Pennsylvania industries heavy losses was broken by a heavy fall of rain on Saturday and Sunday. It is eight months since the Ohio River has been navigable for coal fleets. As a result cities on the river have been suffering for want of fuel. The railroads have been too much occupied and disabled by the drought and could not aid the sufferers. The mines all along the Monongahela River, employing 10,000 miners and helpers, have been idle several months. Mines along the Pennsylvania Railroad had not had water for boilers for a week. The big mills along the Monongahela Valley, one by one, had closed down. In the mountains no water could be had. Many towns along the Pennsylvania Railroad had subsisted on melted snow. The whole of this great region is now relieved and the idle men have been put to work.

The Standing of Test Importations.

The Treasury Department has taken the unusual course of instructing collectors of customs all over the country to disregard a recent decision by Judge Kohlsaat of the United States Circuit Court in Chicago, and by so doing expressed its determined opposition to the practice sometimes adopted by domestic manufacturers who are dissatisfied with the classification for duty of goods competitive with theirs, of making a test importation in an effort to establish a classification at a higher rate. The present case is the latest development in a contest between the domestic manufacturer of decalcomania labels and the importers of European goods of this class. The goods have been coming in as lithographic prints at 20 cents a pound. The domestic manufacturers arranged a test importation through customs brokers of Chicago, and when their goods were assessed at 20 cents a pound filed an appeal to the Board of United States General Appraisers, claiming that the goods were properly dutiable at 50 cents a pound as labels wholly or in part manufactured from metal leaf. General Appraiser Fischer, before whom the appeal came, threw it out on the ground that the importers, having suffered no injury, had no cause of appeal, and in plain terms declared that an appeal for a higher duty than that levied bore on its face evidence that it was not made in good faith. The importers, in this case the domestic producers, appealed from Mr. Fischer's ruling and Judge Kohlsaat decided that they not only had the right to appeal for a higher duty but that in this case the higher rate was the correct one. It is understood that the purpose of the Department in instructing collectors to ignore this decision and continue to assess the low rate is to compel the domestic producers to make another test case which may be tried in the New York Circuit Court, where the judges and the United States attorneys are more familiar with customs law.

The Value of the Rupee.

A new phase in the famous "rupee case," the customs case which Secretary of the Treasury Shaw declared that the courts had decided "seven times wrong" and which is to be finally argued before the Supreme Court early in January, has arisen through the filing with the Board of United States General Appraisers of several protests by importers in Portland, Ore., which base the objection to the Treasury Department's course on an entirely new ground. The controversy is over the value of the Indian rupee for customs purposes. The law provides that in liquidating entries of goods in foreign money the actual value of the foreign coins, as proclaimed by the Director of the Mint for the current quarter, shall be taken, provided, however, that if during the quarter there was a fluctuation in the value of the coin of more than 10 per cent. the exchange value should be taken.

The coin value of the Indian rupee is 20.7 cents. The exchange value, fixed arbitrarily by the British Government, is a little less than 34½ cents. The Director of the Mint, in proclaiming the value of the British Indian money, says that the standard coin is the sovereign, but in a footnote declares that the rupee is the money of account and is current on the basis of 15 to the sovereign. Acting on this footnote the Treasury Department has insisted on liquidating all invoices in rupees on the basis of the exchange value. The importers have protested and have been sustained seven times by the Board of General Appraisers and by the courts. Now, however, the issue is raised in the new protests that the Director of the Mint exceeded his authority in attaching the footnote to his proclamation and that, moreover, the statement of facts contained therein is untrue. It is contended by the importers that the standard coin of India is not the sovereign, but the rupee; that India is not on a gold basis, as is implied in the announcement that the sovereign is the standard coin, and that the rupee does not circulate at the rate of 15 to the sovereign. It is quite likely that if the Supreme Court decides the case now before it in favor of the importers these new cases will be dropped. If, however, the Supreme Court should reverse all the other tribunals that have passed on the case the new argument will undoubtedly be pushed.

Trade Publications.

"The Power of the New York Subway" is the title of an attractive book recently issued by the Allis-Chalmers Company, Milwaukee, Wis. This book describes the part which this company had in the enterprise, which included very much of the power equipment. Several large half-tones show views in the interior of the power plant. There are also other interesting engravings showing special features in the road itself, such as a typical entrance, the station interior, car interior, exterior of the power house, a typical section of the Subway and a view of the great steel span of the viaduct at 129th street, which is 168 feet 6 inches long. The text is as interesting as the illustrations and gives in condensed form a bit of the history of this great undertaking.

Hydraulic Turbines and Governors.—Another publication from the Allis-Chalmers Company gives a description of the hydraulic machinery of Escher-Wyss & Co. of Zurich, Switzerland, the right of which to manufacture in North America is held by the Allis-Chalmers Company. This publication is known as No. 112 and contains a number of interesting views of notable installations, such as those in No. 2 power house at Niagara Falls and also in the power house of the Canadian company. Each of the 11 turbines in the latter installation is of 10,250 horse-power. Another large turbine of horizontal form has a capacity of 6000 horse-power and was built for the Shawinigan Water & Power Company, Shawinigan, Canada.

Electrical and Steam Machinery.—Rossiter, MacGovern & Co., Incorporated, 17 Battery Place, New York, have lately issued a pamphlet of pigeon hole proportions, listing pieces of machinery they have for sale, these including direct and alternating current generators for direct or belt connections; rotary converters, boosters, induction motors, direct connected direct current units, direct current motors, arc dynamos, transformers, switchboards, &c.; also slow and medium speed engines, high and medium speed engines, horizontal and vertical gas and gasoline engines, air compressors and condensers, feed water heaters, pumps, boilers, fire and water tube, &c.

Gas Producers.—Section 1, catalogue A, from the Wile Power Gas Company, Rochester, N. Y., deals with "Producer Gas: Its Uses and Cost." It gives a comparison of producer gas with other forms of power, to show the economy over modern steam plants, and also shows the advantages and efficiency of producer gas as a fuel compared with coal fires, illuminating gas and natural gas.

NOTES.

The Wagner Electric Mfg. Company, St. Louis, Mo., is distributing as one of its publications a reprint of a paper by W. A. Layman on "Single-Phase Power Motors for Electric Light Stations." It was read before the National Electric Light Association at its twenty-seventh convention, held at Boston last summer.

The F. Bissel Company, Toledo, Ohio, has issued bulletin No. 20, descriptive of electrical panel boards. These are described as covering all of the usual requirements of electrical engineers and contractors.

The Chapman Valve & Mfg. Company, Indian Orchard, Mass., has printed an attractive booklet, the alternate pages of which show illustrations of the various forms of the valve which it manufactures, while the intermediate pages give a partial list of users of these valves, classified by States.

The Boulter Mfg. Company, Philadelphia, Pa., is distributing a folder giving the shapes and dimensions of four styles of muffle bricks and calling attention to other bricks or tiles which it manufactures. This company was recently incorporated to continue the business it has been engaged in for the past 69 years.

The Jacobs Mfg. Company, Hartford, Conn., is circulating a leaflet describing the Metcalf emery wheel dresser, and calling attention to its points of advantage. A description of this was given in *The Iron Age* of February 18, 1904.

"The Bettendorf Special" is the subject of a one-piece folder from the Bettendorf Axle Company, Bettendorf, Iowa. It shows a solid train load of Bettendorf steel gear wagons and farm trucks, which is said to be the largest shipment of the kind ever made.

The Sturtevant Mill Company, Harrison square, Boston, Mass., is distributing a circular describing a sample crusher and grinder for the laboratory. It is claimed to reduce the hardest ore to sand at once and to pulverize it to any degree of fineness. A circular accompanying the foregoing announces the company's willingness to place at the customer's disposal its testing department, where the most economical method of crushing may be determined.

The power plant at the new shops of the Electro-Dynamic Company, Bayonne, N. J., is being increased by an additional boiler, engine and dynamo, and a still further increase is looked for in the near future. The company moved its plant to the present location within the past few months. Among its latest developments is what is called the auxiliary pole variable speed motor.

HARDWARE.

THERE is evidence that increased attention is constantly being bestowed by the wholesale Hardware houses on mail orders from the trade. For such orders special departments are usually equipped in the large and progressive establishments, and care is taken to have them given the best attention, not only in promptness of shipment but also in the matter of prices, with an earnest endeavor to meet all the requirements of the customer. Some at least of the houses make it a rule to ship goods on the day the order is received unless there is about it something quite exceptional, such as its covering goods which are not carried in stock or its being received at a late hour in the day. One prominent house acting in this spirit advises us that fully 90 per cent. of its mail orders are shipped on the day of receipt, and as a result of this policy and great care in other directions it is doing a large mail order business which is constantly increasing. Its experience doubtless simply represents that of many other jobbers.

The economy with which the mail order business between the jobber and the retail merchants is conducted is an important reason for cultivating it. The expense of distribution through the regular channels of trade is at the root of more than one trade problem. How to diminish the cost of getting the goods from the manufacturer to the retail merchant is a question which is constantly being considered by all students of trade tendencies. Among these elements of cost the expense of soliciting business through traveling salesmen, first those of the manufacturer and then those of the jobber, holds an important place but is apparently an expense which cannot be dispensed with and which if wisely directed amply justifies itself. So far, however, as the mail order business prevails there is an elimination of this expense. Whether some way cannot be found to encourage it to a greater degree than at present is one of the questions to which the jobbing trade are naturally giving thought. It remains to be seen whether in the modification of trade methods and the shifting currents of distribution something will not be developed which will be for the advantage of merchants and manufacturers. Meanwhile in the adoption of the best methods in connection with mail orders the jobbing trade are giving an example of enterprise and a regard for their customers' interests which is entitled to unqualified commendation.

There is no doubt that retail merchants place a high value on promptness and quality of service in connection with their mail orders. Goods thus purchased are usually wanted in a hurry and any unnecessary delay is annoying and puts merchants frequently to considerable inconvenience. The knowledge that these small orders will have most careful and intelligent attention does, however, more than encourage the sending of them when goods are thus needed, for in this way the merchant is not only impressed with the value set upon his business, but the care given to a trifling purchase has in it something of the nature of a personal service. That a large order will be appreciated may be assumed as a matter of course, but when one for only a few unimportant articles, which perhaps involves some trouble in its execution, is taken care of in the best manner it is a striking evidence of the desire of the jobbing house to place all its facilities at the disposal of its customers in matters small as well as large. The expeditious and considerate handling of an insignificant order has thus something of the effect of a personal courtesy and allies the customer more firmly and by a new tie to the house which is willing to take such pains in his interest. A troublesome and trifling order thus gives the jobber an opportunity which would not be afforded by one of greater volume and possessing intrinsic importance.

Condition of Trade.

Even in the midst of the holidays, and notwithstanding their influence in diverting attention from the regular routine of business, trade in practically all its departments continues remarkably good. While there is something of the slackening in the demand which generally is experienced at this season, there is much less of it than usual. This is a result of the confident feeling which prevails and the tendency, under the stimulus of the strength of the Iron market, away from the low prices which recently prevailed and toward stronger if not always actually higher prices. December with both manufacturers and jobbers has been an active month, and the year closes with scarcely any interruption in the placing of orders. At the same time there are many matters which force themselves on the attention at a season when the books of many commercial establishments are closed and the results of the year's activity ascertained. Arrangements for the annual inventory, too, require attention, so that this complicated and troublesome task may be promptly done in a careful and systematic manner with the least possible disturbance of business. Plans for the future also require consideration, and merchants naturally endeavor to discover and put into operation any changes which should be made in the conduct of business. With the hopeful feeling which dominates the trade, there will naturally be a good deal of renewed and enlarged enterprise, that advantage may be properly taken of the opportunities which present themselves. It is gratifying to note at the end of what has been, we trust, for our readers a successful year the confident expectation of large business in 1905, in the realization of which, with manifold well being, we wish our readers a happy and prosperous New Year.

Chicago

An unusual condition in the Hardware trade has been shown by the fact that the active ordering of goods continued up to Christmas Eve. Ordinarily business done in the last two weeks of December is extremely small owing to the holiday diversions and to the approaching inventory, but dealers all over the country seem to be sending in rush orders based on actual local demand, the character of the orders indicating that they are to supply immediate necessities rather than for speculative purposes. To some extent, no doubt, this activity in business is due to the general feeling that prices will be advanced early in January. Some advances have already taken place. Box Annealed Black Sheet Steel has been advanced 10 cents per 100 pounds; Blue Annealed Sheets, 5 cents; Tin Plate of all grades, 10 cents a base box. Galvanized Corrugated Sheets have advanced 10 cents and plain Corrugated Sheets 5 cents. Machine Bolts have been advanced by the mills 5 to 10 per cent. above actual prices previously quoted, and it is likely that jobbers will advance their prices in still greater proportion. Cast Hollow Ware has been advanced 10 per cent. The old list of Strap and T Hinges has been withdrawn and a new one promulgated. It is understood that in connection with the new discounts to be announced an advance ranging from 10 to 15 per cent. will be made effectual. Trading in Wire and Nails is active. Makers of Coated Nails are gradually advancing their prices until to-day they are only 5 cents per keg below the standard Wire Nail. Sentiment among both jobbers and retailers is that next

year will be an excellent one not only in the matter of volume of business done but in the percentage of profits which are likely to be realized. To the countless friends of *The Iron Age* the best wishes are extended for a new year full of material prosperity and personal happiness.

NOTES ON PRICES.

Wire Nails.—The trade generally are looking for a further advance in prices by the largest producer, which has been anticipated by a leading independent mill which has made the price 10 cents higher, or $1.85, Pittsburgh. Orders are largely for future shipment within the 60 days for which they are accepted, though current demand is fairly active. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carload lots to jobbers	$1.75
Carload lots to retailers	1.80

New York.—Demand is light and will probably continue so until after the beginning of the new year. The New York market is firm at the following quotations: Single carloads, $1.94½; small lots from store, $2.

Chicago, by Telegraph.—Current business is seasonably quiet, but mill order books are growing fat with orders for future delivery. Prices are held firmly at $1.90 base in car lots to jobbers and $1.95 to retailers, with 5 cents extra for less than car lots from mill.

Pittsburgh.—As yet no announcement has been made by the leading interests of an advance in prices of Wire Nails, but it is expected by the trade at any time. We may state that one of the leading independent Wire Nail mills has taken the initiative and has advanced prices 10 cents a keg, or to $1.85, Pittsburgh. Demand for Wire Nails is fairly active for this season of the year, and there is some complaint from the trade over delayed shipments. The mills continue to book orders for shipment within 60 days from date of contract. We quote Wire Nails in carloads to jobbers at $1.75 and in less than carloads at $1.80, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—Orders are being placed with the mills for shipment in the near future, in anticipation of higher prices, and the market is firmly held by independent mills as well as those in the association. Old material, from which considerable steel nail plate is made, is advancing in price. Quotations are as follows: Carload lots, $1.75; less than carload lots to jobbers, $1.80, and to retailers, $1.90 f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo, and all points west of these cities, 10 cents advance per keg on Steel Nails.

New York.—There is little business during holiday week and demand is likely to continue small for some days. New York quotations are as follows: Carloads on dock, $1.89; less than carloads on dock, $1.94; small lots from store, $2.

Chicago, by Telegraph.—The rapidly advancing prices of Old Steel Rails, from which much Nail Plate is made, tend to hold Nail makers, whether bound by association agreement or not, up to official prices. These are $1.90 for car lots to jobbers, $1.95 in car lots to retailers, with 5 to 10 cents advance for less than car lots from mill, according to character and size of order.

Pittsburgh.—The Cut Nail Association now makes a differential of 10 cents a keg between prices of Steel Cut Nails and Iron Cut Nails, instead of 5 cents, as formerly. Demand for Cut Nails is quite active, the trade placing liberal orders in the expectation that prices will be higher. The tone of the market is firm, and we quote as follows: Carloads, $1.75, base; less than carloads to jobbers, $1.80, base; less than carloads to retailers, $1.90, base, plus carload rate of freight to point of delivery; terms 60 days, less 2 per cent. off for cash in 10 days. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are 10 cents a keg higher than above prices.

Barb Wire.—An unusual activity characterizes the market in the way of contract orders which are placed with mills for future shipment. Higher prices are expected by the trade, one independent mill having already advanced prices $2 per ton. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.90	$2.20
Retailers, carload lots	1.95	2.25
Retailers, less than carload lots	2.05	2.35

Chicago, by Telegraph.—Business continues to be unusually active for this time of year, doubtless due to the general impression that prices will advance shortly. Present official figures in car lots to jobbers and large retailers at Chicago are as follows: Painted Wire, $2.05; Galvanized, $2.35; retailers, car lots, 5 cents higher; less than car lots, $2.20 Painted; $2.50 Galvanized. Staples, Bright, $2; Galvanized, $2.30.

Pittsburgh.—Demand is more active than usual for this season of the year, and the mills are entering large orders for shipment within 60 days from date of contract. One leading independent interest advanced prices of Barb Wire $2 a ton last week and refuses to accept business at a less figure. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.90	$2.20
Retailers, carload lots	1.95	2.25
Retailers, less than carload lots	2.05	2.35

Smooth Fence Wire.—A continuance of activity in a usually quiet period is a feature of the market at this time. An advance of $2 per ton by an independent mill emphasizes the expectation of higher prices by other interests. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.60
Retailers, carloads	1.65

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Business is so good that there is little temptation to shade official prices, which are $1.75 for base sizes of Annealed Wire in car lots to jobbers, $1.80 in car lots to retailers, with 5 cents extra for less than car lots. Galvanized Wire maintains its regular extra of 30 cents over Annealed.

Pittsburgh.—It is now between seasons, but the volume of tonnage being placed in Smooth Wire is larger than usual. One leading interest has advanced prices $2 a ton and the trade is expecting notice at any time from the American Steel & Wire Company of a similar advance in prices. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.60
Retailers, carloads	1.65

Strap and T Hinges.—The manufacturers of Strap and T Hinges, &c., have adopted a revised list which bears date December 20. The new list is materially lower than the one it supersedes, there being a corresponding diminution in the base discounts. This list endeavors to avoid the disadvantages connected with the high list which has been in use and the long series of extra discounts which has been developed. The new base discounts are as follows:

	Discount.
Light Strap	70 %
Heavy Strap	75 and 5 %
Light T	65 %
Heavy T	60 %
Extra Heavy T	70 and 10 %
Long Chest	50 %
Hinge Hasps	50 %
Crate Hinges	70 %
Crate Hasps	50 %

The following is the revised price-list of Stanley Works, New Britain, Conn., and 79 Chambers street, New York, which is subject to the discounts named above:

Light Strap No. 900.

3	4	5	6	7	8	10	12	14	16 inch.
$0.85	1.10	1.35	1.70	2.10	2.40	3.30	4.90	6.40	7.90 per doz. pairs.

Heavy Strap No. 902.

4	5		6	8	10	12	14	16	inch.
$1.60	2.15	per doz. pairs.	$0.15	.13½	.13	.13	.13	.13	per lb.

Corrugated Heavy Strap No. 935.

4	5	6	8	10	12	inch.
$1.60	2.15	2.90	4.65	7.20	11.20	per doz. pairs.

Light T No. 904.

3	4	5	6	7	8	9	10	12	14	16	inch.
$0.75	.80	1.00	1.20	1.35	1.50	1.90	2.20	3.00	3.90	5.15	per doz. prs.

Heavy T No. 906.

4	5	6	8	10	12	14	16	18	inch.
$0.90	1.05	1.25	1.55	2.30	3.20	4.45	5.40	5.75	per doz. pairs.

Extra Heavy T No. 908.

4	5		6	8	10	12	14	16	inch.
$1.80	2.45	per doz. pairs.	$0.15	.14½	.14	.14	.14	.14	per lb.

Corrugated Extra Heavy T No. 937.

4	5	6	8	10	inch.
$1.80	2.45	3.15	5.20	7.10	per doz. pairs.

Long Chest No. 910.

6	8	10	12	14	inch.
$1.15	1.50	1.65	2.45	3.00	per doz. pairs.

Hinge Hasps Nos. 912, 914.

3	4½	6	8	10	12	inch.
$0.50	.60	.80	1.05	1.50	2.10	per single doz.

Hinge Hasp Staples No. 913.

3	4½	6	8	10	12	inch.
$0.20	.20	.23	.30	.38	.38	per single doz.

Crate Hasps (single swivel) No. 920, 3 inch, $0.50 per single doz.
Crate Hasps (double swivel) No. 918, 3 inch, .50 per single doz.
Crate Hinges..... .....No. 916, 3 inch, .85 per doz. pairs.

The following is the revised list of McKinney Mfg. Company, Allegheny, Pa., which is subject to the discounts named above.

Light Strap Hinges No. 800.

3	4	5	6	7	8	10	12	14	16	inch.
$0.85	1.10	1.35	1.70	2.10	2.40	3.30	4.90	6.40	7.90	per doz. pairs.

Heavy Strap Hinges No. 803.

4	5		6	8	10	12	14	16	inch.
$1.60	2.15	per doz. pairs.	.15	.13½	.13	13	.13	.13	per lb.

Light T-Hinges No. 805.

3	4	5	6	8	10	12	14	inch.
$0.75	.80	1.00	1.20	1.50	2.20	3.00	3.90	per doz. pairs.

Heavy T-Hinges No. 807.

4	5	6	8	10	12	14	16	inch.
$0.90	1.05	1.25	1.55	2.30	3.20	4.45	5.40	per doz. pairs.

Extra Heavy T-Hinges No. 809.

4	5		6	8	10	12	14	16	inch.
$1.80	2.45	per doz. pairs.	$0.15	.14½	.14	.14	.14	.14	per lb.

Long Chest Hinges No. 811.

6	8	10	12	inch.
$1.15	1.50	1.70	2.45	per doz. pairs.

Hinge Hasps No. 813.

3	4½	6	8	10	12	inch.
$0.50	.60	.80	1.05	1.50	2.10	per single doz.

Crate Hinges No. 815.....3 inch, 85 cents per doz. pairs.
Crate Hasps (single swivel) No. 817.3 inch, 50 cents per single doz.

Carriage Bolts, Machine Bolts, &c.—At a meeting of the manufacturers of Carriage Bolts, Machine Bolts, Lag Screws, &c., held December 21, an advance was made along the whole line. This is the natural result of the condition of the Iron market and the comparatively low prices which have been ruling for this class of goods. The new discounts are as follows, there being the usual extra discounts to large purchasers:

Common Carriage Bolts, ⅜ x 6 and smaller and shorter, rolled thread.....75 and 10
Common Carriage Bolts, ⅜ x 6 and smaller and shorter, cut thread.....75 and 5
Common Carriage Bolts, longer and larger than ⅜ x 6, cut thread.....70 and 5
Machine Bolts, ⅜ x 4 or shorter and smaller.....75 and 7½
Machine Bolts with H. P. or C. P. Plain Nuts, larger than ⅜ x 4.....70 and 7½
Machine Bolts with C. & T. Nuts.....65 and 12½
Machine Bolts, blanks.....70 and 7½
Bolts without Nuts, 6 inches and shorter..10 per cent. addition
Bolts without Nuts, longer than 6 inches...5 per cent. addition
Bolt Ends, with H. P. or C. P. Plain Nuts.....70 and 7½
G. P. Coach Screws.....80
Cone Point Lag Screws.....80 and 5
Skein Screws.....80

Nuts.—The manufacturers of Hot Pressed Nuts at a meeting held December 20 decided upon advanced prices, as follows:

Hot Pressed Square Nuts, blank or tapped.....5.60 cents off.
Hot Pressed Hexagon Nuts, blank or tapped.....6.00 cents off.

The manufacturers report a large volume of business, and a firm tone characterizes the market.

Sheet Zinc.—Another advance in the price of Sheet Zinc is announced by the manufacturers, under date 23d inst. The present quotation is $7.10 per 100 lbs. in 600-lb. casks, f.o.b. mill, with the usual discounts for cash and quantity.

Henry Disston & Sons.—Henry Disston & Sons, Philadelphia, Pa., advise us that they have decided not to make any change in their prices, which will accordingly continue in 1905 as they have been during the present year. They report the demand as very active, and refer to the outlook as exceptionally promising.

Rope.—From the middle of December until the first two weeks of January have passed is always considered a dull period by manufacturers of Cordage. There is comparatively little demand, but values remain about the same as during the past week or more. Quotations are as follows: Pure Manila, 11¾ to 12 cents; Mixed Manila, 10 to 11¼ cents; pure Sisal, 10 cents; Mixed Sisal, 8 to 8¼ cents per pound.

Window Glass.—As the end of the year approaches the situation is not at all favorable to a majority of the hand operated factories. The lack of interest manifested by some of the manufacturers in the formation of the Manufacturers' and Jobbers' Window Glass Company last fall, the absence of uniformity in wages paid by different factories and the failure to induce machine glass blowing factories to change their policy have all contributed to keep prices below profitable figures, except in factories which have exceptionally favorable facilities. Prices have been kept low to force machine factories to change their policy, but in face of this they have advanced their price and are reported as having disposed of their surplus Glass and as having a large volume of business booked. With a continued activity in buying it is considered that it will be some time before production overtakes demand. The local market is represented as not being very strong at the following quotations: First two brackets, single, 90 and 15 per cent. discount; larger sizes, single and all double strength, 90 and 5 per cent. discount, all from jobbers' list of October 1, 1903.

Oils.—*Linseed Oil.*—The market is firm, owing to the lower prices of Oil Cake, resulting from a lack of foreign demand. Crushers are well supplied with Oil, and some are storing it against a failure in the Seed crop at some future time, rather than to make inducements in the way of lower prices to stimulate trade. Large consumers are not showing interest in the market, although crushers are willing to enter contracts covering delivery for two months or more. A limited demand is experienced for small lots. Quotations are as follows: City Raw, 43 to 44 cents, according to quantity; State and Western, 41 cents per gallon, for large or small quantities.

Spirits Turpentine.—There has been little interest manifested by buyers in the market this week. Demand is expected to become more active after the beginning of the year at this point. The market has a firm tone at ½ cent advance over our last quotations. Quotations in New York, according to quantity, are as follows: Oil barrels, 52½ to 53 cents; machine made barrels, 53 to 53½ cents per gallon.

SEARS, ROEBUCK & CO. AND THE MANUFACTURE OF GUNS, RIFLES, ETC.

SEARS, ROEBUCK & CO., the Chicago retail catalogue house, have bought the plant formerly occupied by the Meriden Malleable Iron Works, Meriden, Conn. They will dismantle the Andrew Fyrberg & Sons Arms Company's plant at Hopkinton, Mass., which they own, and will remove the equipment to the Meriden plant, where they will make Shotguns, Rifles, Revolvers, &c.

A. H. FUNKE, 83 Chambers street, New York, has been appointed by Hans Tauscher sole agent for the Luger Automatic Pistols and Carbines for the United States and Canada. Mr. Funke will carry a full stock of the well-known 7.65 caliber as well as the new 9 mm. Pistols and Carbines, with parts and ammunition for same.

Hardware Organizations.

Minnesota Retail Hardware Association.

The annual meeting of the Minnesota Retail Hardware Association will be held at Duluth February 23 to 25, inclusive. The headquarters of the association will be at the Spalding, the leading hotel of the city, and the sessions will be held in the audience room of the Lyceum Theatre. All railroads entering Duluth are making special rates—one fare for the round trip is expected—and all the hotels are guaranteeing a special price to those in attendance. It is expected that the attendance will be in the neighborhood of 500, including members and others. The Programme Committee has already mapped out its work and has the programme well along. President A. T. Stebbins of the association will be in Duluth after the holidays and assist in closing details. It is hoped to make this one of the very best meetings the association has ever had. As a wholesale Hardware point Duluth occupies a conspicuous place, and there are many interesting attractions from a Hardwareman's point of view.

Chicago Retail Hardware Association.

The annual meeting of the Chicago Retail Hardware Association was recently held. The attendance was large and a number of new members were enrolled. This is one of the most successful local Hardware associations in the country, and an important feature of its work is co-operative buying, by a committee of the association, of materials on which low prices are secured from manufacturers in consequence of the volume of business given.

Ohio Hardware Association.

The Executive Committee of the Ohio Hardware Association met on the 20th inst. at the Algonquin Hotel, Dayton. The next annual convention will be held at the Algonquin on February 28 and March 1 and 2. Some very interesting changes are being planned in the programme for the next meeting. In addition to Mr. Bogardus, president, and Mr. Corey, secretary of the National Retail Hardware Dealers' Association, it is hoped to have other gentlemen well known in the trade present. The Executive Committee is working very earnestly to make the coming convention one of great educational value for every retail Hardware dealer. A. L. Shearer of the firm of Rooney & Shearer, Dayton, was appointed by President Baker to fill the unexpired term of Financial Secretary Jones, who has taken charge of a Hardware establishment in the State of Washington. The corresponding secretary of the association feels very much encouraged by the number of applications for membership within the last few days.

Colorado Retail Hardware Dealers' Association.

The 1905 meeting of the Colorado Retail Hardware Dealers' Association will be held at the Adams, Denver, February 14 and 15. New members are constantly coming into the association, and judging from the interest taken by merchants all over the State the coming meeting will be a distinct success. Some special features will make the occasion unusually interesting. National Secretary Corey will be in attendance, and an instructive address will be given on "The Science of Salesmanship."

BALTIMORE STAMPING COMPANY.

BALTIMORE STAMPING COMPANY, Baltimore, Md., manufacturer of Ferro Silicate Enamel Ware, is now in position to supply a partial line of these goods. A price-list just issued covers Pie Pans, 8, 9 and 10 inch; Jelly Cake Pans, 9 and 10 inch; Milk Pans, 1, 2, 3 and 4 quart; Pudding Pans, 1, 1½, 2, 3 and 4 quart; Shallow Stew Pans, 1, 1½, 2, 3 and 4 quart; Deep Stew Pans, 1, 1½, 2, 3 and 4 quart; Lipped Sauce Pans, Nos. 12, 14, 16, 18, 20 and 22; Preserving Kettles, Nos. 140, 160, 180, 200 and 220; Wash Bowls, Nos. 26, 28, 30 and 32; Covered Buckets, 1, 2, 3 and 4 quart; Covered Piece Sauce Pans, 1½, 2, 3 and 4 quart. The company has established branches in New York, Philadelphia and Boston, where samples are carried.

LEE RICHARDSON & CO.'S NEW STORE.

LEE RICHARDSON & CO., Vicksburg, Miss., have recently opened an up to date store at Jackson, Miss., for handling Wagons, Buggies, Harness, &c. The building is 60 x 200 feet, two stories and basement. It is lighted by electricity and gas. The front is of pressed red brick laid in white mortar. The windows are without wood work, being of solid glass. The two show windows are 20 feet wide by 24 feet deep and arranged to give a street effect, in which will be placed up to date vehicles, and in which changes will be made each week. The dimensions of the windows are such that the largest vehicles can be displayed full rigged and completely equipped. Customers can pass into the windows from the rear and thoroughly inspect the display. The first floor accommodates 75 vehicles, besides Harness, Saddlery, Robes, &c. The second floor is arranged for the display of Wagons, Carts of all descriptions and Heavy Harness; also for trimming and repair departments. There is a commodious reception room, with baths; also a reading room and bedrooms for the accommodation of the company's traveling men. The rough stock and accessory goods, such as Spokes, Poles, Hubs, &c., are carried in the basement. The first floor is 15 feet high, the second 18 feet, both arranged with mezzanine floors to increase stock carrying capacity. Telephones are installed at various points for instant communication. The building is especially complete in all details and has been found admirably adapted to the requirements of the business.

RUSSELL & ERWIN MFG. COMPANY.

RUSSELL & ERWIN MFG. COMPANY, who for more than 50 years has carried in Philadelphia a stock of Builders' and other Hardware, announces that on January 1 this entire stock will be withdrawn from its warehouse, now located at 19 North Fifth street, and a small assorted stock of Builders' Hardware only will be carried at 1430 Chestnut street, new showrooms, where a full line of samples may be inspected. Business will be solicited by the same representatives as heretofore. A large and complete stock is carried at the company's New York warehouse, 43-47 Chambers street, from which orders will be promptly filled. Accounts will also be handled direct from the New York house.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses and are referred to the manufacturers:*

FROM NEBO BROTHERS, Homestead, Pa., who have recently completed a number of improvements contributing to the attractiveness and convenience of their Hardware, Stove and Paint store.

FROM THE RANCH SUPPLY COMPANY, Ellsworth, Neb., incorporated with a capital of $25,000, to succeed Ranch Supply Store.

FROM SCRANTON & HAUSAMAN, Cashion, O. T., successors to Scranton & Co., wholesale and retail Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, &c. The store has been greatly enlarged and improved.

FROM FRED. R. BLAKE, Troy, N. Y., who has succeeded Willard R. Cooley in the Hardware, Paint and House Furnishings business.

FROM D. A. LE FEVRE, Greenfield, Ohio, who will succeed Le Fevre & Boden in the Hardware business on January 1, Mr. Boden retiring.

A WORD TO THE HARDWARE JOBBERS.

PITTSBURGH, December 19, 1904.

To the Editor: The jobber and the manufacturer alike are in business for making money. This is a time worn and obvious platitude. Many manufacturers have in the past been indifferent as to whether the jobber made 20 per cent. or 2 per cent. on the goods he sold, and most if not all the jobbers have not cared a continental whether or not the manufacturer made a fair profit on the goods he made.

This System of Mutual Disregard

works no doubt very well in patches, hence it is delusive, but if we take a few steps back to increase our range of vision and half close our eyes to blend the isolated facts, we find that the good ship Hardware, with her two independent crews, one running the port and the other the starboard engine, each without any regard whatever for what the other is doing, is running a very broken course, wasteful of time and wasteful of fuel.

The manufacturers show signs of mending their ways but the jobbers have yet to give those signs, after which, each helping the other, that unnecessary scarecrow of present day trading, "selling at cost," will become a thing of the past.

When a Buyer Has Played Manufacturers Against One Another,

made a few exaggerated statements, bluffed here and bluffed there, and has finally pounded the price of a commodity to within an ace of its life, he honestly believes that he has done something "great." Well, this is what he has done: He has brought the manufacturer face to face with the problem of selling goods at demoralized prices without losing money, he will speed up his machines, he will push his production, he will cut down the quality of raw material and of supplies, and as a necessary consequence quality will be at a discount and inspection will relax. Push your manufacturer on price and he will fall victim to one of the worst diseases in the manufacturing world, the Tonnage Craze.

See What the Tonnage Craze

has done for us during the past few years: The unreliable tool steels that cause discouragement in our tool rooms, the "bum" castings with the air holes which turn up in the wrong places, the oval circles and the rhomboidal rectangles that proceed from rolling mills which beat the world for speed and poor quality. Prosperity has bred competition, competition has bred low prices, low prices have bred poor quality.

No doubt much of this tonnage craze is the result of cupidity and of the necessity of paying cash dividends on paper values, but the fact remains that demoralization of prices will bring about precisely the same results. The evil effects do not stop there, but sentiment does not find much place in business in this Age of Iron.

It is an unfortunate fact that when prices drop many manufacturers believe they can make up for it on tonnage. Spurts are given to production and, as a market must be found for the surplus, the immediate effect is to drop the prices still lower. Thus the common complaints of most manufacturers of staple articles—"No money in the business," "Life cut out of it," &c. There is money in every legitimate business if it is run right, and it is "hoggishness" or incapacity that will cut the life out of it.

A Time Comes Inevitably as the Result of Cutting Prices

when a manufacturer's business shows a handsome deficit on the capital engaged. Then comes the reaction. Manufacturers come together in an endeavor to stop the cutting of prices and bring them up to a reasonable level. This is difficult work in the face of the utter lack of sympathy—the lack of understanding the facts in the case—which the jobbers display. It is not long before the buyer again pounds prices, and the chicken hearted among the manufacturers allowing themselves to be pounded, the associations break up and the whole cycle of operations is resumed—the quick drops and the slow, painful rises; two years of prosperity to six of stagnation.

The Jobber's Experience.

So much for the manufacturer. Now, meanwhile, how has the jobber fared, on whose behalf the hard working—and, let me add, the well meaning—buyer has been slaughtering the manufacturer's profits? He has fared very much the same way that the manufacturer has. He has sold the persecuted goods on smaller and smaller margins. The reason he has not noted anything unusual in the general volume of his business is that all goods are not persecuted at the same time. Nay, worse, the jobber has had to compete with the manufacturers themselves for the trade of the dealers and of the small consumers. No associations of manufacturers means no differentials for jobbers—half a dozen and half a dozen gross fetch the same price.

A Popular Fallacy.

Every once in a while enthusiastic people start out to manufacture some Hardware staple. They believe there are millions in manufacturing—of any kind—and they point at the many who have made their fortunes in this way. They are not aware that most of the fortunes made in manufacturing within the last ten years have been made not by dividends, but by manipulations which cannot be carried on forever in the face of the public which is paying the costs. It is that very fallacy about the profits of manufacturing which causes these enthusiasts to start their little shop with 25 men and a gas engine making Shovels or Stove Bolts. They expect to do wonders. As a rule they cause an immediate drop in prices—"We must get the volume." Having no cost records to scare them, they only look for tonnage, tonnage, tonnage. The capital they have invested and the loans which they are able to negotiate keep them floating for a few years, after which, if they cannot get out by some clever manipulation, they go to the wall, leaving footsteps on the sands which are soon washed away by the tide of public delusions.

Neither Moral Nor Fair.

The jobber as a rule encourages these delusions. He sells his loyalty for a mess of Hardware which he buys below cost. Unawares, he has purchased stolen goods, for the loss is taken out of the pockets of the stockholders and note holders of the manufacturing concern by their officers and managers. It is not a manly, it is hardly an honest, way of conducting business to sell or to expect to buy goods below their cost. It is neither moral nor fair, and any steps which will remedy this state of affairs should be welcome to upright and conscientious men. But as long as the business atmosphere lacks morality, as it does at present, so long will this state of affairs prevail. Not until a roundabout but successful swindle is put on a par with a straight but unsuccessful one will conditions change.

The regulating of prices by manufacturers, with free competition on quality and services under a liberal but strict State supervision of corporations, would be

The Greatest Safeguard,

the greatest boon which the jobber could wish for. If the manufacturers make fair profits they will allow liberal differentials to the jobbers who distribute their goods, and they will confine their sales to these jobbers and to the large independent consumers. The moment profits are cut the dealer and the small consumer will hear from the manufacturer who is seeking to save the differential for himself by cutting out the middleman—the jobber.

More mutual consideration, more public spirit and more care for the future are the blessings we need during the promising new year which is opening before us.

ALFRED SANG.

A. MUGFORD, engraver and electrotyper, Hartford, Conn., has purchased the plant and good will of the business conducted for many years by Wilbert C. Healy at Worcester, Mass., and will continue at the same location as heretofore. Mr. Mugford's facilities for the prompt execution of orders for engraving—wood, line or halftone—and electrotyping are now exceptionally complete, the Worcester plant having one of the best equipped electrotyping foundries in the country.

Trade Winning Methods.

This department will contain a description of approved methods of bringing customers to the store by means of newspaper advertising, circulars and such special expedients and methods as are found useful by enterprising and progressive Hardwaremen.

A cordial invitation is extended to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

TWO WINDOW DISPLAYS OF TOOLS.

THE accompanying illustrations are reproductions from photographs of displays of spring Gardening Tools and Carpenters' Tools, arranged in the show windows of E. N. Howell Hardware Company, Dixon, Ill. The corner of a garden display is represented in Fig. 1, with cloth background. The upper third of the background was of dull red and the lower part was black. The picture of the elk is set into the background to give depth to the scene. Tarred Paper was first laid on the floor and covered with fresh dirt, edged with newly cut sod. The shrubs were cut just before the buds were ready to burst into leaves. The veins were last year's morning glories. The rail fence was made of Fence Rails, with a sample of Poultry Netting, upon one end of which was a card reading: "The old fence and the new." In the window there was a fox, a quail, a partridge and a prairie chicken. In the front of the window were various Garden Tools and a bowl of Grass Seed.

Fig. 1.—Window Display of Spring Gardening Tools.

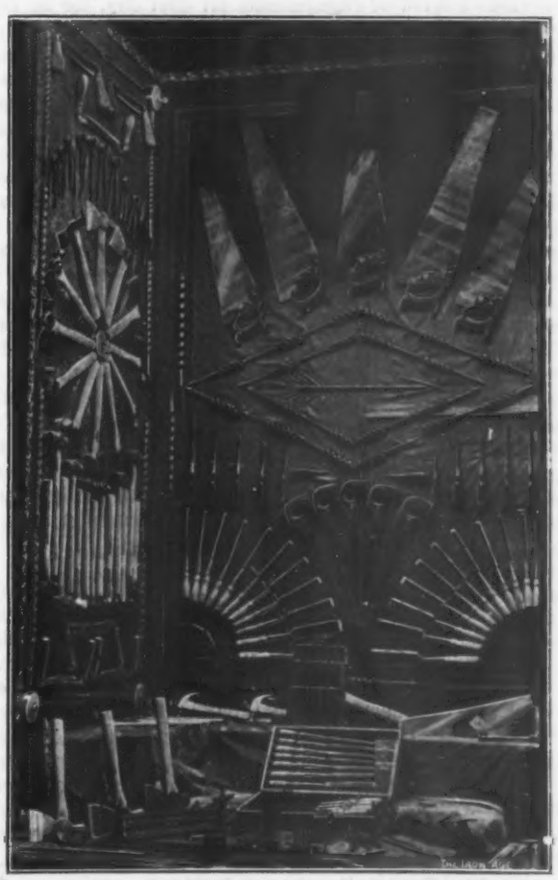


Fig. 2.—Carpenters' Tools in a Show Window.

The display of Carpenters' Tools shown in Fig. 2 involved a considerable amount of work, resulting in a very artistic arrangement of the Tools. The boards were well balanced, with sufficient space between the different designs to avoid any suggestion of crowding.

METHODS OF CULTIVATING TRADE.

THE SEMINOLE HARDWARE COMPANY, Wewoka, I. T., tries to make and hold customers by always carrying complete stocks of the goods it handles, and displaying them in an attractive manner. The store is large and well lighted and Warren shelving is used to stock and display shelf Hardware. The company is a liberal advertiser in the local papers, using the best cuts obtainable. The newspaper advertising is devoted largely to agricultural machinery.

Mailing List Cards.

Fig. 1 is a reproduction of one of the company's mailing list cards, these being kept in a filing case. On the cards the company tries to keep a complete record of the doings of its customers and others whom it wishes to make customers, also of those with whom it does not wish to have business relations. The list includes the heads of all families in a radius as large as the company may reasonably hope to reach. The company keeps hammering away at these with circulars, personal letters and trade literature. A good mimeograph is found invaluable in this work. Two country salesmen who look after the credit business, and at the same time are watching for new deals and prospective buyers, have

the entire mailing list copied into convenient memorandum books, in which they enter changes and corrections, as well as additions to the list from time to time. These notes are transferred to the cards. The list of names

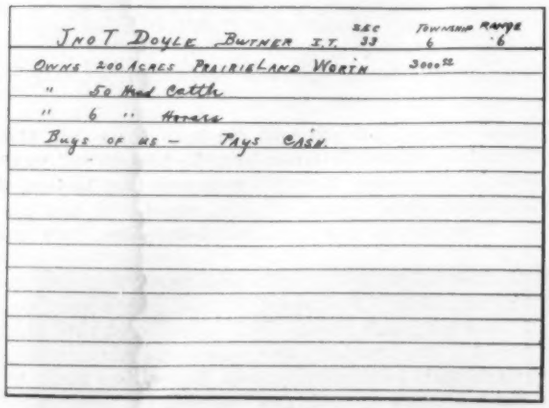


Fig. 1.—Mailing List Card.

was originally made up through the assistance of the postmasters in the company's territory and from the records in the clerk's office.

Prospective Customers' Cards.

The reproduction of a prospective customer's card in Fig. 2 shows how this class of customers and their probable wants are kept track of. When a man gives an idea of what he expects to buy at some future time a card is filled out containing this information and filed in the "prospect" drawer of the file. On this card is kept a record of the letters written him, whether country salesman calls on him, and, finally, when he buys, or if the company fails to sell him why it failed. The details of this system may appear to entail a good deal of

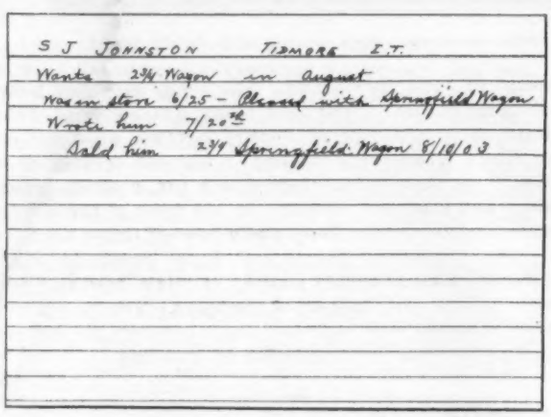

S J Johnston Tidmore I.T.
Wants 2¾ Wagon in August
Was in store 6/25 — Pleased with Springfield Wagon
Wrote him 7/20 02
Sold him 2¾ Springfield Wagon 8/10/03

Fig. 2.—Prospective Customers' Card.

"red tape," but when once systematized the manager finds time to keep it up with the occasional help of one of the boys in the store.

Marking Goods in Plain Figures.

What is considered an important feature in the cultivation of trade is the marking of all goods in plain figures. This policy has been adopted by the company as the result of many years' successful experience in the Hardware business.

CHARLES SPARKS, general manager of the retail department of the Simmons Hardware Company, known as the "Broadway Store," at Broadway and St. Charles streets, St. Louis, Mo., has resigned his position, taking effect January 1. Mr. Sparks' connection with the Simmons Company covers a period of 17 years, the last nine as general manager of the retail store. This branch of that great business is said to have quadrupled, approximately, since Mr. Sparks became responsible for its conduct. His plans for the future are as yet not fully matured.

THE LONDON BUSINESS MAN AND HIS NEW YORK COUSIN.

A LETTER FROM A VISITING ENGLISHMAN.

THE London business man presents a remarkable contra type to his New York cousin, and, speaking generally, the difference between the manner of transacting business in New York and in the Old World metropolis is almost as great as the wide ocean which separates them. The Londoner is the quintessence of methodism and conventionality. He sleeps, awakes, dresses, eats, drinks, takes exercise, does his work and seeks pleasure with a rigid regularity and punctiliousness which must appear to a stranger as a ludicrously monotonous existence. Yet, 'tis not so. There are very few people who go through the many vicissitudes and anxieties of this world with more self composure, satisfaction and greater pleasure than he. Averse to risky speculations and devoid of an oversanguine temperament, he naturally devotes himself and his time to matters of a certain character. He looks askance at ventures and prefers to dabble with undertakings that do not savor of precarious results. He knows the extent of his exchequer to a penny and knows, too, how much he can legitimately spare and play with, without sacrificing his social and business status and especially without disturbing his home, domestic relations and surroundings. He makes haste slowly in most things and hates to be unduly hurried; he is wont to spend much time, perhaps too much, in weighing pros and cons and in pondering over the problematic issue as to whether a certain decision or action would be strictly honorable.

The Typical Routine of a Day.

The average business man in London rises early, generally about 6 a.m., and having indulged in his matinal ablution and completed his physical exercises, he sits down to enjoy his morning repast, and punctually at a stated hour he leaves home for his office, either by carriage, train, 'bus or afoot, meanwhile cursorily glancing over his newspaper. Arrived at the office he peruses his list of engagements for that day, for he conducts most of his business by appointment, and at once personally attends to his correspondence. The greater part of the day is occupied in transacting previously arranged business, and not infrequently he makes it convenient to have a desirable customer or friend call and lunch with him at his club. Occasionally he absents himself from the office to attend public or private meetings, or perchance to accompany his wife and family to a social function; now and again he goes to "Lords" to witness an important county or intervarsity cricket match, to a race meeting, football match, boat race or matinee; but, whatever he does and wherever he goes is predetermined and nothing will divert him from pursuing his wonted life by rule. When in town he hardly ever misses lunching at his club, and it is on very rare occasions he utilizes this—to him—sacred social city sanctum for business purposes. On returning to his office he resumes his daily routine, and finally he revises and signs his letters and departs for home, usually about 5.30 p.m., leaving his officials working with the quietude and solemnity becoming an undertaker's establishment.

Dignity and Respect in a London Office.

The average London office is permeated with an air of dignity, respect and politeness. There is no hustling or undue familiarity; smoking is as stringently prohibited as unbecoming attire is discountenanced. The principal or superior official is regarded and treated as an employer or superior should be—with proper respect. The subordinates on their part are taught to keep their place, but at the same time they are at all times treated kindly, courteously and with consideration. In offices where women and girls are employed, these are invariably allotted separate apartments, and always receive the politeness and attention worthy of their sex.

The Commissionaire and His Functions.

A familiar and very admirable official in most of the best London offices and establishments is the "commis-

sionaire," a uniformed retired soldier of mature years and good conduct. His duty is to attend to the wants of callers, and he does it in real disciplined military fashion. As you enter the office portals you find him on guard, as it were; he first looks for your card, in the absence of which he politely asks your name. Then usually the following dialogue ensues:

"Who do you wish to see, sir?"

"Mr. ——; is he in?"

"Have you an appointment with him, sir?"

"No."

"Then I am afraid it will not be possible for you to see him to-day; he is very busy and full of engagements, but I will take your name in as soon as he is at liberty if you will please be seated."

"Thank you; please tell him I wish to see him on a matter of importance, that I won't keep him more than a few minutes."

"Certainly, sir."

The commissionaire leaves the visitor in a beautifully furnished waiting room, on the table of which will be found most of the daily newspapers, magazines, and other periodicals, as well as a variety of chosen books of general interest. Presently the official returns with the following announcement:

"Mr. ——— presents his compliments and says he is very sorry, but that he is fully engaged for most of the day; but if you can make it convenient to call again in an hour he might be able to give you a short interview, or if you would rather write and make an appointment for another day it would be better."

The Londoner's Way of Doing Business.

When the interview does come off it takes place within the precincts of the principal's own private office, which is safeguarded by closed doors against invasion or disturbance as long as the business lasts. The visitor is at once placed at his ease by a pleasant preliminary conversation, generally relating to social or current events of the day, and when actual business is reached he finds a patient, practical and considerate auditor. He must not, however, expect an immediate decision, for the Londoner will not jump at hasty conclusions. He takes his time and gives every matter which he has in hand serious and careful consideration. He is predisposed to act overcautiously, but he generally does what bears the next day's reflection, and particularly avoids acting in haste to repent at leisure.

Of course this is not intended as a representation or illustration of all Londoners; it is a portrayal only of the old fashioned London business man, who is at the head of most of the best and well regulated metropolitan houses, and who finds himself in his commercial vocation either by inheritance, relationship, social connection or financial influence. There are, it is true, many, very many, exceptions. The most advanced is the Americanized Londoner, who is rapidly revolutionizing and propelling every phase of commercial and literary life in the metropolis. There are also very many people in London—as, perforce, must be in every city—of speculative and sanguine tendencies, of irregular habits and difficult to catch. Grasshopper-like, they flit from office to office, then to the Exchange, and on to the club, hotel or other such place, seeking and seizing all the chance business they can come across; and, although much in evidence, they are comparatively in the great minority and have little, if any, effect in disturbing the orthodox, steady and slow flow of London commercial life and status.

The New York Business Man.

New York, as it presents itself to me and according to my observation, has, if anything, a greater variety of business men than London, but the prominent and predominant type here is unmistakable. He is unquestionably a prodigy in the commercial world. His natural brusqueness, promptitude and power of handling matters of magnitude are unrivalled. Against long odds and within comparatively a few years he has involuntarily contributed his great share in establishing or founding a city which is recognized indisputably as the most enterprising and businesslike center in the world. In the face of almost insuperable difficulties and stubborn opposition he has successfully pioneered the vanguard of American commercial invasion, and penetrated and asserted himself conspicuously in both civilized and uncivilized countries.

His growth has been as rapid as his success has been marvelously achieved, his indomitable pluck and energy in attacking powerful and established opposition and in launching monster undertakings are as admirable as his natural and businesslike method of accomplishing his task, and his willingness to amicably co-operate with his British and other rivals is as praiseworthy as the readiness of his competitors to embrace Americanization is commendable and wise.

There is no gainsaying that the New Yorker as a business man has no equal; it is questionable, however, whether he enjoys as much real pleasure in the pursuit and acquisition of a colossal fortune as his less fortunate or less ambitious rivals. It is to be feared that he is too worldly, too grasping, too anxious to accomplish great things in the least possible time. He becomes highly strung and a victim of a highly nervous temperament. His chronic state of restlessness, his irrepressible energy, his promptness, his matter of fact speech and conduct, his apparent heedlessness of all that does not concern him, his abrupt treatment of matters which do not interest him, and his almost vicious seizure and practical manner of dealing with anything savoring of business are peculiar traits in a typical New York business man. It matters not where or under what circumstances you meet him, he is forever intent on doing business. Business is his sole theme.

The Genus Young America.

All this has special reference to the adult male, but the same business aptitude is discernible in the youth, who, with his parents' concurrence, is eager to leave school at the earliest moment to embark in business, and a business where he can better himself. If one place does not suit him he unhesitatingly leaves it for another and again another—not particular as to the character of the vocation—until at last he finds abundant scope for his ambition to become a successful business man. The same spirit is present in many of the fair sex, and however unsexed her position or occupation may appear to the stranger, she revels in fulfilling manly pursuits and in competing with her male rivals in every branch of business life, and, to her credit be it admitted, she succeeds astonishingly.

NORVELL-SHAPLEIGH HARDWARE COMPANY'S SMOKER.

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., on the evening of December 22 gave a smoker at the Missouri Athletic Club to a large number of its salesmen. All the officers of the company were present. A novel and amusing feature, which created a great deal of merriment, was contests for two handsome scarf pins. In one contest 25 items in the Hardware, Cutlery and Sporting Goods lines, without tags or marks, were laid before the salesmen, and each man was required to place a valuation upon each item on a sheet of paper provided for that purpose. In the other contest each salesman was supplied with a list of 25 staple Hardware items, and was required, from memory, to enter opposite each item the selling price. The great variety of prices given in both contests was the cause of much good natured raillery. The prize for judging the value from the article itself was won by J. A. Ballew of Tennessee. The prize for prices on staple items was carried off by W. R. Beesley of Arkansas. This was the first of a series of four smokers to be given by this company to its salesmen. These meetings are of the most informal character. Some of the experiences related by the salesmen were not only amusing but very instructive, especially to a number of the younger salesmen present. The president congratulated the salesmen upon their successful efforts the past year. He stated that the business of the house had been very satisfactory, and showed a substantial increase over last year.

CANADIAN TARIFF ON AMERICAN GOODS.

THE new regulations promulgated by the Canadian Government at Ottawa pertaining to customs duties on imports from the United States, which became operative October 1, 1904, owing to the annoyance and confusion occasioned both Canadian importers and exporters from the United States, have not been enforced during the interim between that date and January 1, 1905, in order to give all interested parties a reasonable time to accommodate themselves to the radically changed conditions. With the advent of 1905, however, no goods will be passed through Canadian custom houses unless requirements concerning invoices and prices are complied with. The accompanying form of invoice is that prescribed by the Canadian officials, and which must be used in billing goods to Canada. The following certificate of value is prescribed for invoices of goods sold and exported to Canada, to be signed by the exporter or by a partner, official or employee of the exporter having a knowledge of the facts certified to, and to be written, printed or stamped on the invoice, viz.:

I, the undersigned, do hereby certify as follows:

1. That I am the*..... of the exporter of the goods in the within invoice mentioned or described;

2. That the said invoice is in all respects correct and true;

3. That the said invoice contains a true and full statement showing the price actually paid or to be paid for the said goods, the actual quantity thereof, and all charges thereon;

4. That the said invoice also exhibits the fair market value of the said goods at the time and place of their direct exportation to Canada and as when sold at the same time and place in like quantity and condition for home consumption, in the principal markets of the country whence exported directly to Canada, without any discount or deduction for cash, or on account of any drawback or bounty, or on account of any royalty actually payable thereon or payable thereon when sold for home consumption but not payable when exported, or on account of the exportation thereof or for any special consideration whatever;

5. That no different invoice of the goods mentioned in said invoice has been or will be furnished to any one; and

6. That no arrangement or understanding affecting the purchase price of the said goods has been or will be made or entered into between the said exporter and purchaser or by any one on behalf of either of them, either by way of discount, rebate, salary, compensation or in any manner whatsoever other than as shown in the said invoice.

7. Whereas German goods are subject to a surtax in Canada. I certify that none of the articles included in this invoice are the product or manufacture of Germany, and that the chief value of none of such articles was produced in Germany, save and except all articles opposite which the word "Germany" is written on this invoice.

Dated at.....}
this.....day of.....19..}

.....

* Insert the word partner, manager, chief clerk or principal official, giving rank as the case may be.

The above form of certification can be printed on back of invoice, as is done by the John Polhemus Printing Company, 121 Fulton street, New York, which has the blanks on sale for the convenience of exporters or shippers in this market.

As a result of the new regulations the following additional points are to be noted:

NUMBERING OF PACKAGES.—Shipments of more than one case or package must show contents of each and be numbered from 1 up, or consecutively from any number selected as a starting point, so that the exact contents in each case, barrel, &c., are indicated on the invoice.

EXPRESS SHIPMENTS.—With each express shipment there must be three certified invoices, two to accompany the goods and a third for the customer.

FREIGHT SHIPMENTS.—Freight shipments require three certified invoices, which should be sent to the customer, two to be filed by the customer at the custom house. All invoices must be certified to in accordance with the printed form on each invoice, the invoices conforming to prescribed Canadian specifications.

FAIR MARKET VALUE.—These words in the Canadian regulations are understood to apply to a fair market value of the goods in the United States. Where there is

Form (1M)—INVOICE OF GOODS SOLD BY THE EXPORTER PRIOR TO THEIR SHIPMENT TO CANADA.

Invoice of _____ 190 _____ purchased _____

by _____ of _____

from _____ of _____

to be shipped per _____

☞ See Instructions on the other side.

MARKS AND NUMBERS ON PACKAGES.	QUANTITIES AND DESCRIPTION OF GOODS.	FAIR MARKET VALUE AS SOLD FOR HOME CONSUMPTION.	SELLING PRICE TO THE PURCHASER IN CANADA.	
			@	AMOUNT

more than 5 per cent. difference between the fair American value and the price made for Canadian market the customs official in Canada computes the duty on the American price, and after allowing the importer in Canada the benefit of the 5 per cent. lower price there is added to the regular tariff charge the difference between the permissible price and anything in excess of it. Anything below the American price less an extra 5 per cent. must be added to the duty paid by the importer. For example, if a fair market value in the United States is 50 per cent. discount from list, the merchant in Canada cannot obtain the goods without penalty at better than 50 and 5 per cent. discount. If for any reason the merchandise is billed lower, say at 60 per cent. discount, the difference between 50 and 5 and 60 per cent. would be calculated and added to the regular duty based on a 50 and 5 per cent. cost.

The purpose of the new regulations is to prevent American manufacturers possessed of a surplus stock from dumping it in that market at low prices to the detriment of Canadian manufacturers. The enforcement of the new rules will probably have a tendency to compel American manufacturers desirous of selling in that market to operate factories on Canadian soil, as some are already doing and others arranging to do. To what extent it will interfere with existing trade relations and the growing volume of importations from this country into Canada remains to be seen.

STUDY THE METHODS OF OTHERS.

BY OBSERVER.

THINGS and conditions, no matter how unnatural or how wrong, seem perfectly right to us as we become accustomed to them. This is just as true in store keeping as in life generally. It is human nature for man to become a part of his surroundings. It pays to shake the dust of familiar paths from your shoes occasionally. Change of scene brings new ideas. It helps the mind, helps the body, makes a stronger man. Ninety-nine times out of a hundred it helps to make a bigger, better business.

Too Close to His Business.

The average local Hardwareman is too close to his own business. He sees the same store, the same shelves, the same fixtures, the same faces, day after day, until it becomes second nature for him to accept all conditions—good, bad and indifferent—exactly as they are, and he gets to a point where he fails to distinguish one from another. That has been the first step backward in many a flourishing business.

There's a Hardware merchant in a southern New York village who hasn't been five miles away from his own store in five years. He's up at five o'clock in the morning. He feeds and cares for his own delivery horse. He opens his own store at six o'clock, has it partly swept out and dusted before the first clerk shows his face. He works harder than any other man in the store all through the day, and often goes back at night to make a complete job of it. Commendable industry? Yes—but that business hasn't cleared a cent above expenses in the last three years!

Where the Fault Lies.

Generally speaking, business conditions in his locality are as good as ever. Merchants in other lines are making reasonable gains. But hundreds of dollars' worth of business—hundreds more than ought to go naturally—are going to a nearby city. The fault is not with the location, nor the store itself, but with the store management and the store keeper. If he would spend a single day in that city where much of his trade is going, he could gather ideas enough to keep his working force busy on improvements for a week—inexpensive improvements.

An Excellent Investment.

That man will tell you that he cannot afford the trip. He really thinks that he cannot afford it. But he can. The cost of it would be one of the best investments that he ever made. His application to business shows him to be diligent by nature. A man of his temperament couldn't possibly spend a day among contemporary stores in another city without learning something at every turn. It is not because he isn't observant that he has failed to grasp new ideas. It is because he has not permitted himself to go where the ideas are to be seen in execution. On the other hand, it isn't a lack of observance that makes him fail to see the faults in his own store. It's his long and close association with them which has made him a part of them. On his return from a trip of this character he'd be astonished to find the true conditions prevailing under his own roof. There are far too many Hardwaremen struggling along in this same rut.

Modern Business Built on Ideas.

Ideas are the very cornerstone of modern business in every line. The aggressive, up to date, successful business man wants ideas. He travels far and wide in search of them. He pays enormous prices to obtain them from others. The biggest men in the retail business today are the keenest observers of the actions of their competitors. The owner of one of the greatest businesses in New York City recently made a 1000-mile journey to investigate the workings of a single branch of a contemporary store in a distant city. The trip resulted in the adoption of a simple plan which has netted the establishment thousands of dollars in less than six months.

Visit Great Trade Centers.

Visit the greatest trade center that you can afford to reach. While there try to land some special merchandise drives to serve as business boomers when you return home. But the greatest good that your business can derive from your trips will be from the things that you see and remember—the good business ideas that you take home in your head. Good head work counts immensely in business nowadays. The man who succeeds is the man who thinks.

Good Trade Papers.

Next to your own observation your trade papers are your best friends. Those that are conscientiously conducted are constantly on the alert for new ideas and new methods. If you read them carefully you are bound to think. That's a step in the right direction.

CALENDARS, ETC.

CLEVELAND PNEUMATIC TOOL COMPANY, Cleveland, Ohio: An attractive pictorial hanger calendar.

BEALL BROS., Alton, Ill.: Card of felicitation, bearing "A Twig from Our Christmas Tree."

THE G. DROUVE COMPANY, Bridgeport, Conn.: Hanger monthly calendar.

CHARTER OAK STOVE & RANGE COMPANY, St. Louis, Mo.: Set of blotters with celluloid covering, conveying the company's good wishes for the new year.

SICKELS, PRESTON & NUTTING COMPANY, Davenport, Iowa: "Modern Paintings," a beautiful collection of half a dozen colored reproductions from the original paintings.

NORTH & JUDD MFG. COMPANY, New Britain, Conn.: An attractive folder, carrying greetings to customers and the trade generally.

JOHN ROURKE & SON, Savannah, Ga.: A mammoth pictorial hanger calendar.

THE HOTCHKISS BROS. COMPANY, Torrington, Conn.: Black leather covered diary and memorandum book for the vest pocket.

C. H. CASEY, Jordan, Minn.: An attractive pictorial hanger calendar for the new year.

F. E. MYERS & BRO., Ashland, Ohio: Large poster and calendar, in which attention is attractively called to their line of Pumps, Hay Tools, &c.

The Weinsheimer Hardware Company, recently incorporated, has opened a new store in Milwaukee, Wis., at 2401-2403 Walnut street. The active members of the company are A. Weinsheimer, R. C. Freihube and Edwin Kraus, all of whom have had long experience as Hardwaremen. The company will carry a complete line of Hardware, Stoves and General House Furnishings.

TRADE ITEMS.

WARREN D. ROLLINS, who conducts the foreign trade of John G. Rollins & Sons, 15 Whitehall street, New York, at their branch houses, 124 Holborn, London, E. C., and 12 Lancelots Hey, Liverpool, England, has arrived in New York on his annual visit to the various manufacturers in the United States represented by the house. He speaks of a more cheerful feeling in trade circles in Great Britain for some months past and says a satisfactory business is anticipated for 1905. His headquarters for the remainder of his stay will be at their New York address.

JOHN S. LENG'S SON & Co., 93 Reade street, New York, wholesale dealers in Bicycle and Automobile Supplies, Accessories, &c., will move to 33 Murray street, northwest corner of Church street, January 3 next. They have secured a lease of the premises, which includes for their purposes the street floor and two commodious basements, thus enabling them to consolidate under one roof their sales department and warehouse. This will also permit them to pay more attention to Supplies for Automobiles and especially Automobile Tires.

THE PRITCHARD-STRONG COMPANY, Rochester, N. Y., successor to Pritchard Mfg. Company, advises us that its new factory is rapidly nearing completion and that it will soon be in the market with new lines of metal novelties, including Lanterns, Bread Mixers, Sink Strainers and other useful household utensils. The company expects that the new features which will distinguish its products will make them of special interest to the consumer and the trade.

SCHWABACHER HARDWARE COMPANY, Seattle, Wash., in January will move into its large new building, which has been under construction for the past few months. The building, which is modern and up to date in all respects, is 75 x 247 feet, eight stories and basement, and in connection with a one-story warehouse for the accommodation of heavy goods will put the company in excellent position to handle its constantly growing trade.

THE PATTON PAINT COMPANY will have a conference of its representatives in Milwaukee, Wis., on January 3, 4 and 5, at which it is expected about 100 officers and salesmen will be present. The session will close with a banquet at the Hotel Pfister.

A. TREDWAY & SONS HARDWARE COMPANY, Dubuque, Iowa, has purchased the stock of Heavy and Shelf Hardware carried by the Schreiber, Conchar & Westphal Company, also of Dubuque, and the first of the year will move its office and Shelf Goods department to the building formerly occupied by the latter company at 761 to 767 Iowa street. The Tredway Company will continue to occupy its buildings at 465-471 Iowa street. This purchase will give the Tredway Company an especially large stock in Shelf and Heavy Hardware lines.

SARGENT & Co., 149-153 Leonard street, New York, have issued an ingeniously illustrated booklet about House Door Locks. There is a series of illustrations numbered from one to five, so that when looked at in numerical order, with the brief explanatory type matter, the appearance and mechanism of their Easy Spring Locks are made plain.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

ASPHALT RUBBER PAINT COMPANY, Washington, D. C.: Circulars relative to Beckwith's Asphalt Rubber Roofing Paint.

HENRY J. WEIBLE, Delphos, Ohio: Circular calling attention to his specialty of Hand Shaved Handles, which are made from selected second growth hickory.

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SCOFIELD COMPANY'S NEW STORE.

THE SCOFIELD COMPANY, which has stores at Sturgeon Bay and Sawyer, Wis., has recently completed a new store at the former place, to which the accompanying illustrations relate. The company has an old and well established business, so that its long experience in the diversified requirements of an extensive clientage has enabled it to amply provide improved facilities for the stocking, displaying and handling of the varied lines of goods which are carried, including Heavy and Shelf Hardware, Cutlery, Sporting Goods, Iron and Steel, Wood Stock, Paints and Oils, Mill Supplies, Ship Chandlery, Pumps, Windmills, Stoves, Ranges, &c. The company also conducts a tin shop and does steam fitting and plumbing.

Fig. 1.—Front of Scofield Company's New Store.

Fig. 2.—Right Hand Side of Salesroom.

The building is a substantial one of cut stone, with a warehouse in the rear. The front of the store is shown in Fig. 1, the plate glass extending to the second story, so that it conveys the idea of one large display window. A

row of electric window reflectors extends the full length of the upper and lower fronts at the center sash bar, resulting in a fine effect when lighted. The show windows are floored with Chinese matting, the back being covered with green burlap.

The arrangement of the entire central group of showcases is illustrated in Fig. 3. These are lighted by electricity and each contains a separate line of goods, such as Pocket Cutlery, Fishing Tackle, Revolvers and Sporting Goods, Razors, Strops, Barbers' Soap, Hones, Manicure Sets and Shaving Brushes, Bicycle Goods, Cameras and Photographic Supplies, Shears and Scissors, Silver and Nickel Table Ware, &c. In the immediate vicinity is the stock of Bicycles, the floor space occupied by them being covered with red carpet.

Fig. 3.—Showcases in Center of Salesroom.

Fig. 4.—Left Hand Side of Salesroom.

In Fig. 2 the right hand side of the salesroom is shown, illustrating the arrangement of Kitchen Utensils on one side, the stairway toward the rear and a portion of the showcases in the center of the room. The room has a metallic ceiling, which is high, permitting a large amount of shelving space to be utilized to advantage.

The left hand side of the salesroom, with office in the

rear, is shown in Fig. 4. Within the inclosure formed by the central showcases is a long case of drawers, with

Fig. 5.—Catalogue Case in Private Office.

Hatchets and Hand Axes, Guns, Fishing Rods, Bit Braces, Drawing Knives, &c. Underneath the cases are drawers, and above and toward the back Warren shelving for Hardware.

A portion of the catalogue case, located in the private office, is shown in Fig. 5, with sliding glass doors above and drawers below. Each drawer is numbered, and contains circulars, samples, &c. Entered in an index, such as is used in connection with account books, are the numbers of the drawers, with their contents placed opposite. This has proved a very convenient way to keep track of catalogues.

On the second floor is a showroom, Fig. 6, containing Bathroom Outfits and a model kitchen. In the latter a Range is set up ready for use, with a Slop Sink, Kitchen Sink and a Work Table, with samples of everything new for kitchen use. There is also a lavatory. By this plan goods are displayed to better advantage than if surrounded by other stock.

A portion of the front of the warehouse is shown in Fig. 7, together with the method of handling heavy goods. The 6-inch steel I-beam is about 20 feet long. The traveling hoist has a ¼-ton differential chain block. with eay and grab hooks to hook onto a barrel, box or Stove, any of which may thus be easily lifted clear of the floor or wagon and transported in or out, as the case may be. A trap door in the floor of the warehouse admits of anything being lifted from the basement or lowered into it.

Fig. 6.—Showroom on Second Floor.

Fig. 7.—Handling Heavy Goods at Warehouse.

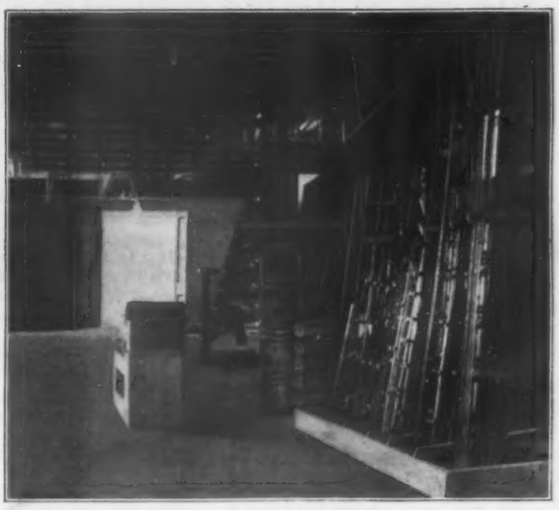

Fig. 8.—Barn Door Rail in Warehouse.

Scales, Meat Choppers, &c., on the top. The wall cases on the left of the entrance, shown in Fig. 4, are each devoted to a separate line of goods, as Hammers,

The tin shop is on the second floor of the warehouse, the shop being lighted on three sides. A feature of the shop is the Stove blacking room, where a Stove can be

taken apart or blacked and repaired, and not be disturbed if the workman is obliged to leave his work for a time.

A portion of the interior of the warehouse is illustrated in Fig. 8, showing especially the way Barn Door Rail is kept.

A dynamo in the basement furnishes the lighting, and also operates a force pump, with a line of pipe extending to the store front and back, where hose connections are placed for washing windows, &c. The pump is also used for filling a large tank in the upper story, which supplies water for lavatories and closets in toilet rooms on each floor.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, 10 NORFOLK ST., LONDON, W. C., December 17, 1904

The Week's Hardware Trade.

THE condition of the Ivory market is attracting some attention. Since the Ivory sales in July every description of Ivory suitable for making handles for Cutlery has jumped 30 to 35 per cent., a very important factor in the manufacture of Cutlery. Heavy American offers are the cause of this, the chief American buyers being Arnold Cheney & Co. of New York and Wood & Brooks of Buffalo. These firms practically monopolized the October sales in Antwerp, to the exclusion of British and Continental buyers. Prices were driven up from £44 per hundredweight in April to £66 in October for precisely the same article. At these high prices Sheffield and London buyers were obliged to stand aside, while the large Continental houses were almost equally out of it. The position for the future is not too promising. Even if the next sales experience a cessation of American competition—which those best informed do not in the least anticipate—the stocks in the hands of the English and Continental buyers are so depleted through their inability to obtain their normal supplies at the last two quarterly sales that there is almost a certainty of prices further advancing. An idea seems prevalent among country ironmongers and buyers of Cutlery generally that Ivory cutters and Cutlery manufacturers almost rejoice in dear Ivory. The exact opposite is the case, for more Ivory Cutlery is sold and more profit made when Ivory is at a reasonable price.

The present position of the Hardware and Cutlery trades is analyzed as follows:

Brass Work, Bedstead Making, &c.—Employment was bad in the Brass trade generally, but was better than a month ago, though not so good as a year ago.

Nuts, Bolts, Nails, &c.—Employment with Nut and Bolt makers was moderate in Birmingham and Smethwick; in South Wales and at Dudley it was dull. In Birmingham employment was moderate with Cut Nail makers and quiet with makers of Wire Nails and Machine Made Rivets. In the Blackheath district employment with the makers of Wrought Nails and Rivets was slack.

Tubes.—In this branch employment generally was slack.

Chains, Anchors, Anvils, Vises, &c.—With Chain makers employment at Cradley was slack; at Gateshead it was fair; at Pontypridd it continued very slack. Anchor smiths were slack at Cradley and at Pontypridd. With the Anvil and Vise makers in the Dudley district employment was slightly better. In Birmingham and West Bromwich employment was fair in the Axle trade, and also with the Spring makers at West Bromwich; at Wednesbury it was good, and with Railway Tire makers it had improved. Employment was slack with makers of Harness Gear at Walsall.

Locks, Keys and General Hardware.—In the Lock, Key and Latch trade employment continued bad. With the Hollow Ware trades generally it was quiet; it was bad at West Bromwich With makers of plantation and Brazil Hoes at Wednesbury it was good. In the smaller Hardware trades it was quiet.

Files, Edge Tools, &c.—In these trades employment was moderate to slack.

Cutlery, &c.—In the Sheffield Cutlery trades employment was generally slack. In the Fish Hook trade at Redditch employment was good.

Sheet Metal, &c.—In London the Zinc workers and the Tin and Iron Plate workers were very slack. At Birmingham it was fair in the Iron Plate and Rolled Metal trades, and moderate in the Tin Plate branch. At the Lye there was some improvement in the Iron Plate trade. At Bristol, Exeter, Glasgow, Edinburgh, Hull and Dundee it was fair.

Wire Work.—Wire drawers and Wire weavers generally were fairly employed. With Wire workers at Manchester there was a further improvement.

Walter P. Notcutt.

Walter P. Notcutt of Bristol House, Holborn Viaduct, informs me that he is visiting America, not only to consolidate his business connections, but also to extend them. This gentleman has now been vigorously pushing American agencies for four years and has made a success of it. During the past few years not only have British manufacturers been alertly on the defence, but American exporters have been spasmodic in supplies to an irritating degree. Walter P. Notcutt has not only succeeded in keeping his customers supplied with goods, but has sold his goods in increasing proportions. He now employs several assistant travelers, who cover Great Britain and Ireland. His system is: (*a*) Absolute direct representation; (*b*) full disclosure of all business transacted; (*c*) invoicing direct; (*d*) separate set of books for each principal; (*e*) separate banking accounts for each principal.

It will be observed that Walter P. Notcutt by these methods builds up a valuable trade connection for American houses, a connection which increases and grows under the control of the American house. The system has taken a long time to inaugurate and has involved considerable capital expenditure, as remuneration is by results, and with travelers, offices and warehouse, expenses are considerable. Mr. Notcutt soon found that to supply customers not only promptly but even in small quantities it would be necessary to carry stock. He therefore arranged with his principals to receive stock on consignment, and this has proved a valuable factor in the conduct of the business. He returns either monthly or quarterly, as desired, the stock account to headquarters, so that the exact position is always known to his principals. Inasmuch as small beginnings necessitate sample orders, he has been enabled to open a number of new accounts which would otherwise have been impossible had he depended upon New York shipments.

In the warehouse, among the goods stored, I noticed the manufactures of several well-known firms.

There are two classes of trade cultivated by Walter P. Notcutt. He is in friendly relation with the jobbers and the tool dealers throughout the country, but it must be remembered that London transacts not far from 80 per cent of the export business to the British Colonies. This department is also being successfully tackled, and is worth the attention of American houses seeking a connection with South Africa, Australia, India or elsewhere.

I heard the other day of a case where an advertisement in *The Iron Age* of a novelty had led to considerable business. This is only one of a number of cases and it may be interesting to show the value of advertising for foreign business. A number of agents over here are on the *qui vive* and this should be remembered.

Mr. Notcutt will be in New York December 30, and letters will reach him addressed in care of *The Iron Age*.

HARDWARE STOCKS IN BRAZIL.

FROM A SPECIAL CONTRIBUTOR.

THE American representative of a London financial syndicate, recently returned from an investigation into the condition of several industries connected with the railways and the interior carrying trade of Brazil, and who is especially familiar with the American Hardware trade, writes interestingly concerning trade in the provincial cities of that distant country. While stopping at Pousso Alto, a town in the Province of Minhas Geraes, he happened to be present when an account of stock was being taken by a local Hardware merchant, and, having been accorded permission to make some notes of the incident, he jotted down in shorthand a pretty full inventory of the dealer's wares. Among these were some items of a peculiar nature. We follow the account and comments as they appear in the traveler's notes:

Progress of Civilization.

"Three dozen pairs of Handcuffs!" called the stock clerk.

"Hold on a moment," I said. "What were these Handcuffs for, Senhor Sequeira?"

"For the slaves," he replied. "These bracelets have been carried on my stock book for more than forty years. Just three dozen pairs; no more, no less. They cost me 5 milreis a pair, altogether 180 milreis, and that, too, when milreis were at par. In American money this would amount to nearly $100 gold. The outlay at compound interest for forty years would bring the cost up to $1600. It is absolute ruin." Here he flung a handful of them on the floor with a gesture of disgust.

"Never sell any of them?"

"Not a pair. Why, sir, the slaves were so humble, so submissive, so inoffensive, that they never revolted, even though some of them were whipped to death. You could lead them by the nose. As for the Handcuffs, I was a fool to buy them."

Penny Wise, Pound Foolish, Salesmanship.

"What induced you to commit such a folly?"

"I was young, inexperienced and new to the trade. A Birmingham salesman who came this way flattered and humbugged me, then induced me to sign an order for these and other useless wares, some of which are still on my shelves. Look here," he continued, dragging down from the shelves package after package of Japanned Tea Trays and Waiters. "Here are sets of 12, 16, 20 and 24 inch Trays and dozens of 12-inch Waiters, more than I can hope to sell in a century. I signed for a whole caskful without knowing it."

Shortsighted Trickery.

"Wasn't the order written out in your own language?"

"Yes; but it was so cunningly done that I was unaware how large it was. It read something like this: '1 doz. ea. 12 to 24 in. Trays, Nos. 250 to 260, inclusive.' That doesn't look like a big order, does it? Well, it almost broke me. I had to call on my relatives to help me out. The amount of the invoice, together with the duties, charges and carriage up from Rio, came to over $1000 in American gold."

More Sleepers.

The stock clerk continued his inventory. Among the items was a lot of single barreled muzzle loading Pistols, over a foot in length, with bores not much bigger than a pea. Next came sundry packages of Sheffield bone-handled Table Knives, with two-prong Forks. A few packages with ivory handles had three-prong Forks. One package had four-prong Forks. Not a single plated Fork in the lot. I asked about this. He said he had never carried plated Forks, so I dropped the subject. "Pocket Cutlery," called the clerk. This was a miscellaneous lot, some from Sheffield, some from Solingen, none from the United States. Among other items was a number of coarse, single bladers, incased in cast iron dogs, an ancient acquaintance. To my surprise he said they were good sellers. The Scissors were all of German manufacture, ill made and dear.

Fertile Territory for Ambitious Americans.

Butcher Knives came next. Some of these had the well-known Wade & Butcher stamp. A few were of French make. These, he said, sold best. Razors, all German; not bad, but all very dear. He hadn't one that he could afford to sell for less than 10 milreis (about $2). When he came to the Carvers and Forks he exhibited with great pride a few sets made by the Meriden Cutlery Company. "I bought these in Rio some years ago," said Senhor Sequeira. They are some of your own country's goods. They help to sell the others, so I am not anxious to part with them. If, as you say, these houses manufacture full lines of Cutlery equal to these samples, why don't they send their salesmen out here with them? Is the home demand so great that they have no desire to export their goods to foreign countries?"

Manufacturers' Direct Representatives Best Introducers.

"No; but they depend on the commission houses in Rio to sell their goods in Brazil."

He laughed. "A poor stick to lean upon are the commission houses. They have their own lines to sell, and if they order any American goods at all it is to help sell their German wares. The commission houses! *Ahi! Quel tonterias!*" or something to that effect.

Museum Relics.

The exhibit of carpenters' tools was ludicrous. These consisted for the most part of Hand Adzes, Hammers, Hatchets, Axes and a few Chisels, Rip and Hand Saws, Augers, Gimlets and Awls. He hadn't a Back Saw or a Plane in stock. No Braces and Bits, no Spirit Levels, no Calipers nor Compasses, no Foot Rules, only metrical Measuring Tapes. The whole of his meager stock was of Sheffield make—coarse, heavy and ill balanced. The Hammers had no claws, the Axes had almost straight helves and were so badly balanced that, as compared with a modern American Axe, they would require double the labor to wield them.

Modern Labor Saving Tools Unknown.

He had never seen a full set of carpenters' tools, and it is doubtful if he knew their names or uses. Upon being asked if there were no carpenters in Pousso Alto, he replied yes, there were, but they used the Hand Adze for most purposes, even for planing, and unless we sent a man along with the tools I spoke of to show how they should be used he was afraid there would be no sale for them. I couldn't make him appreciate the economy of labor which they would effect. Labor was cheap enough, he said—a milreis (20 cents) per diem. I then advanced the idea of superior workmanship, better results, better furniture, better houses, and the like. He thought that what they had was good enough.

Other Merchants Anxious to Progress.

I am glad to be able to say that such was not the opinion of the other Hardware merchants I talked with. Some of them were eager for improvement and thought that better tools would make better workmen, and, moreover, that the planters and citizens would appreciate and be willing to pay for advancement. One house at which I stopped, at Santa Lucia, had been built by workmen brought from Rio by the Conde d'Eu, a Bourbon Prince, who had married a daughter of Emperor Dom Pedro. It was of much superior workmanship and the envy of all the planters in the vicinity.

Hardware Common Here Unknown in Brazil.

The Builders' Hardware in this merchant's stock was of the same antiquated character as the rest. No round-headed nor Brass Screws, no Wire Nails nor Brads, no fancy Butts or Hinges. The Door Locks, Bolts and Latches were cumbrous, heavy and dear. Spring Hinges, Door Springs, Brass Butts and a host of other familiar items were conspicuous by their absence. The contractor who undertook to erect a modern dwelling in provincial Brazil would have to import his entire stock of Hardware, or else be content with a meager variety and fancy prices at Rio. I never saw a decent bricklayer's Trowel in the whole of my journey beyond the railway lines, covering over 600 miles of equestrian travel and embracing probably 100 towns and villages. Metal Ceilings and numerous other items in common use in the United States are practically unknown, even in the coast cities.

A Chance for Pioneers.

The country Hardware merchants are almost destitute of House Furnishing Goods. They have neither Stoves nor Toilet Sets, no Folding Chairs or Ladders, no Perambulators, no Refrigerators, Meat Safes nor Ice Cream Freezers. Mention of the latter always raised a laugh. There are plenty of milch cows in Brazil, but the people use no milk in their coffee, and make no butter, only a little hard cheese, whose color raises a suspicion of not being very clean. Ice for domestic use is unprocurable, and to drink a glass of water made from hail is considered impious. The household Stove is another novelty. The Brazilian kitchen consists of a little brick furnace, such as a boy might construct; roast beef *(coteletas)* is unknown, except by an incorrect translation, and is impossible to procure outside of the coast cities. The domestic cookery of the provinces is limited to fries and stews, chiefly the latter. It is almost always pork and rice, or beef and maize, or pork and maize,

or beef and rice. At one "hotel," where they had a brick oven at the rear of the building for baking bread, it was being used for a pig sty. No private family bakes its own bread. A modern cooking Stove would revolutionize the country by introducing table luxuries which now are unknown.

Brazil as a Field for American Hardware.

The plain fact is that the provincial Brazilian does not know how to live. The commonest workingman in a New York tenement house has a better, and I may add a cleaner, table than the proudest magnate of this truly great and rich but very backward country. On one *fazenda* (estate) they made me, as a special favor, a little butter by shaking some milk in a wide-mouthed bottle. They had 150 head of cattle, but not a single Churn. Brazil is a great field for American Hardware, but the men who represent the goods will have in many cases to instruct the buyers how to use them.

AMONG THE HARDWARE TRADE.

Chas. Hood, Puyallup, Wash., dealer in Hardware, Stoves, Implements, Paints, &c., has doubled his facilities for doing business by leasing the adjoining building. The wall between has been removed, and the main storeroom is now 40 x 80 feet in dimensions, the total floor space afforded by the enlarged establishment being in excess of 7000 square feet.

Ridgeway Hardware Company, Ridgeway, Ohio, has succeeded Adams & Dille, Mr. Dille retiring from the business, and his interest being purchased by Mr. Adams.

M. J. Barber has purchased the Hardware, Stove, Implement, Paint and Sporting Goods business formerly conducted by P. Brown, at Worthington, Minn.

On January 1 the Kent Hardware & Mercantile Company, Kent, Iowa, will be succeeded by C. H. Thomas & Co., who will continue the sale of Hardware, Paints and Harness in connection with the lumber business.

The large establishment of the Hawks Hardware Company, wholesale and retail, Goshen, Ind., was destroyed by fire on the 17th inst. The estimated loss is $57,000, with insurance of $32,800. The company will rebuild and resume operations as speedily as possible.

G. H. Luehrs has bought the business formerly conducted by the Sahlborn Hardware Company, Worthington, Minn.

Jeffersonville Merchandise Company, Jeffersonville, Ohio, has succeeded C. D. Bush in the Hardware and grocery business.

W. M. Kellogg has purchased the general Hardware store formerly conducted by T. H. Bell, Jefferson, Ohio.

Beck & Corbett, dealers in Hardware, Farm Machinery, Paints, &c., Waynesboro, Pa., will dissolve partnership January 1. Mr. Corbett will retire and Daniel Benedick will acquire his interest, the firm style becoming Beck & Benedick.

Patterson Brothers have bought the Hardware, Stove, Farm Implement and Sporting Goods business of W. A. Payson & Co., Toronto, Kan.

V. Blatt has just moved into his new store at East Brady, Pa. The building is located on the site of the old store, which was destroyed by fire in March last. It is 45 x 80 feet, two stories, and is especially well equipped for the Hardware business.

The Hardware Supply Company, Baltimore, Md., formerly located at 128 South Calvert street, and temporarily located at 326 North Gay street, will move to its new warehouse, 34 Light street (near Lombard), on or about January 1. The company will carry in stock a full line of General and Building Hardware, Cutlery, Guns, Ammunition, Sporting Goods, &c.

Rust's Invisible Top Hanger.

The Dallas Screen Company, 118 Bryan street, Dallas, Texas, manufacturer of door and window screens, has just put on the market an invisible top hanger, here shown. The device is designed for hanging all over screens and storm sash or half size screens. Fig. 1 illustrates the hanger complete, made of wire shapes of suitable gauge. Two small holes bored at the top window casing are made for the short arms of the two wires to swing in, the lower arm of the wire on the left of the illustration being driven permanently into screen or storm sash. A small hole bored through the screen at the right allows the horizontal rod with hook to be pushed through, when the other parts are readily put in position, Fig. 2 showing by means of the portion cut away how the application is made. Thus in operation the screen or sash is hung from above, and can instantly be swung outward to clean a window, &c., and as easily removed entirely by a slight pull on the cord and pendant, which causes the rod on right at top to recede and enables the individual to swing the other support out of position. The screen is held firmly at the bottom in a vertical position by means of two wire parts, one pointed and straight, to be driven horizontally into window casing strip, and the other bent at right angles and threaded on one end, to be screwed into the screen or storm sash, the operation of which is indicated in Fig. 3, a turn to the left releasing so that screen can be swung out at bottom.

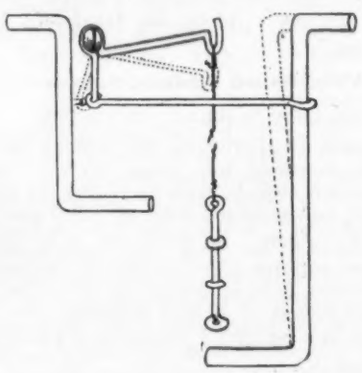

Fig. 1.—Rust's Invisible Top Hanger.

Fig. 2.—Showing Method of Installing.

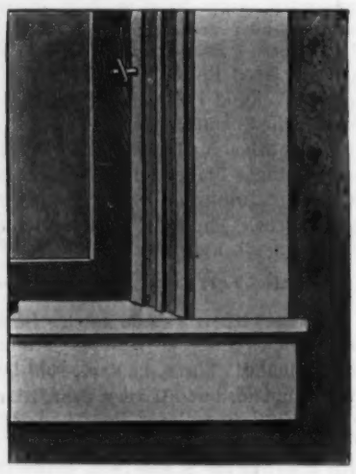

Fig. 3.—Fixture for Holding Screen Close to Window.

Bullard Automatic Wrench.

The Bullard Automatic Wrench Company, Providence, R. I., has just put on the market the Bullard Automatic Wrench, here illustrated. Fig. 1 shows the wrench proper, Fig. 2 indicating the process of gripping an object. The parts are drop forged from best grade steel and the jaws of high grade tool steel, we are advised. Some of the essential features of the wrench emphasized by the company are the strong grip, which is firmer on account of the ability to grasp much more of a hexagonal connection than usual; impossibility of slipping or crushing of pipe, no lost motion in operation and jaws always in alignment. It locks and unlocks instantly without cramping or wedging on pipe. Other points to which it directs attention are the great strength and leverage, which is especially

Fig. 1.—Bullard Automatic Pipe Wrench.

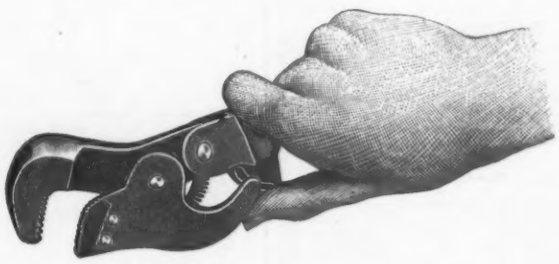

Fig. 2.—The Wrench in Operation.

marked at the angle of the upper jaw, ascribed to having a deeper cross section and a tangent rather than a perpendicular strain. No more strain comes upon this wrench, it is said, when used at the widest extension than when operated at normal capacity. The construction is described as insuring even wear, the strain on working parts or jaws being distributed by use on different sizes of pipe, &c. At present the wrench can be supplied in 8, 10 and 14 inch sizes, longer ones being in process of manufacture. The No. 1, or 8-inch size, takes from ⅛-inch wire to ¾-inch pipe; No. 2, 10-inch, ⅜ to 1¼ inch, and No. 3, 14-inch, ½ to 2 inch pipe.

Fountain Bath Brush.

B. H. Cook, 183 Broadway, New York, is the manufacturer of the Twentieth Century fountain lather and spray bath brush, here illustrated. In the nickeled brass hinged cover soap chamber, which is 4 x 2⅝ inches inner dimensions, soap in pieces, cake or pulverized form can be placed, or a suitable sponge charged with liquid soap inserted. On the end of the reservoir is a nickeled threaded brass tube, 1 x ⅜ inch, to which is screwed a detachable black enameled wood handle, 1 x 6 inches, largest dimensions, through which passes a metal tube. In use, a length of rubber tubing is attached to basin or bathtub faucet and also to a similar tube on end of handle, when warm or cold water or a combination to suit can be used. Ordinarily the brush can be operated without the handle, while otherwise inaccessible parts can be reached with it, it being more convenient without handle for washing hands, face, shampooing head, &c. This device soaps, sprays and brushes at the same time, or sprays and brushes, or performs either operation separately. The brushes are made with white bristles of both soft and medium stiffness, and for the more vigorous of heavier dark bristles, the bristles in all cases being rigidly fastened with brass wire to a perforated hard rubber back plate for durability. A fine shower can be quickly obtained with clear water without putting anything in the soap container, or various forms of medicated agents can be used at the option of the individual.

Fountain Bath Brush.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9⅛@ 9¼
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price	@ 1½
Lead, American. Terms: For lots 12 tons and over ⅛¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4⅝@ 4¾
Zinc, French:	
Paris, Red Seal, dry	8½
Paris, Green Seal, dry	9¾
Antwerp, Red Seal, dry	7½
Antwerp, Green Seal, dry	8½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	11¾@12¾
Lots of less than 1 ton	12¾@12¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	10¾@11¼
Lots of less than 1 ton	10¾@11¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@4.00
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6⅝
Lots less than 500 lb	@ 7
Ocher, American	₱ ton $8.50@16.00
Orcher, American Golden	2½@ 3½
Orcher, French	1¾@ 2¾
Orcher, Foreign Golden	3 @ 4
Orange Mineral, English	8¾@10½
Orange Mineral, French	10½@11¾
Orange Mineral, German	7¾@10
Orange Mineral, American	8 @ 8¼
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¾
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital. Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $20.00@30.00
Talc, American	₱ ton $13.75@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb	No 1 .60 @70
Terra Alba, American, ₱ 100 lb	No 2 .45 @60
Umber, Turkey, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	38 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	₱ ton $17.50@20.00
Barytes Amer. floated	₱ ton 16.00@17.00
Barytes, Crude, No. 1	₱ ton 10.00@11.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls	₱ 100 lb @ .35
China Clay, English	₱ ton 11.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@
Whiting, Common	₱ 100 lb .45@ .48
Whiting, Gilders	₱ 100 lb .55@ .57
Whiting, Ex. Gilders	₱ 100 lb .58@ .60

Putty—

	₱ lb
In bladders	1½@2
In bulk	₱ 100 lb 1.05@1.15
In cans, 1 lb to 5 lb	2¾@4
In cans, 12½ to 25 lb	1¾@2

Spirits Turpentine— ₱ gal.

In Oil bbls	.53 @53½
In machine bbls	.53½@54

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	6 @ 8
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	7 @10
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	8 @11
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	42 @44
Bone Dried	51 @54
Button	45 @60
Diamond I	50 @..
Fine Orange	52 @54
A. C. Garnet	45 @46
D. C.	1.00 @1.10
Octagon B	55 @56
T. N.	47 @50
V. S. O.	60 @..

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	43 @44
Linseed, City, boiled	45 @46
Linseed, State and West'n, raw	41 @..
Linseed, raw Calcutta seed	@55
Lard, Prime, Winter	57 @59
Lard, Extra No. 1	48 @49
Lard, No. 2	36 @38
Cotton-seed, Crude, f. o. b. mills	17½@18
Cotton-seed, Summer Yellow, Prime	21¾@25
Cotton-seed, Summer Yellow, off grades	@24½
Sperm, Crude	@..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	@4
Sperm, Bleached Winter	@47
Tallow, Prime	@50
Whale, Crude	@..
Whale, Natural Winter	@..
Whale, Bleached Winter	@..
Menhaden, Brown, Strained	@28
Menhaden, Light, Strained	@29
Menhaden, Bleached Winter	@32
Menhaden, Ex-Bld. Winter	@33
Menhaden, Southern	19½@20
Cocoanut, Ceylon	₱ lb 6¾@ 6¾
Cocoanut, Cochin	₱ lb 7¾@ 7½
Cod, Domestic, Prime	@38
Cod, Newfoundland	@41
Red Elaine	@33
Red Saponified	₱ lb 4½@ 4¾
Olive, Italian, bbls	@55
Neatsfoot, prime	@51
Palm, prime Logos	₱ lb 5¾@ 6

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	@12
Black, 29 gravity, 15 cold test	@13
Black, Summer	@12
Cylinder, light filtered	18½@19½
Cylinder, dark filtered	16¾@17½
Paraffine, 903-907 gravity	@13½
Paraffine, 903 gravity	@12¾
Paraffine, 883 gravity	9¾@10
Paraffine, red	@13⅜

In small lots ½¢ advance.

Pat'l

REVISED DECEMBER 27, 1904 — December 29, 1904

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ₰ doz $3.00 ..... 33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent 35%
Taplin's Perfection 35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils ..... ₰ lb 7¼@7¾ ¢
Hay-Budden, Wrought ..... 9@9¼ ¢
Horseshoe brand, Wrought ..... 9@9¼ ¢
Trenton ..... ₰ lb 9@9¼ ¢

Imported—
Peter Wright & Sons ..... ₰ lb 10½ ¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00 ..... 15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Hull Bros. Co. ..... 30&10%
Livingston Nail Co. 33⅓%

Augers and Bits—
Com. Double Spur ..... 75@75&10%
Boring Mach. Augers ..... 70&10@75%
Car Bits, 12-in. twist ..... 60@60&10%
Jennings' Pattern ..... 60&10&10@70%
Ford's Auger and Car Bits ..... 40&5%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25%
No. 30, R. Jennings' list ..... 40&7½%
Russell Jennings' ..... 25&10&2½%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45%
Millers Falls ..... 50&"3&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits ..... 40&10%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist ..... 60&10%
Wright's Jennings' Bits (R. Jennings' list) 50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $36 ..... 50&10%
Clark's Pattern, No. 1, ₰ doz. $26; No. 2, $18 ..... 50&10%
Ford's, Clark's Pattern ..... 50&10@60%
C. E. Jennings & Co., Steer's Pat. 25%
Swan's 60%

Gimlet Bits—
Common Dble. Cut, gro. $3.00@3.25
German Pattern ..... gro. $4.50@4.75

Hollow Augers—
Bonney Pat., per doz. $9.00@10.00
Ames ..... 25&10%
New Patent ..... 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—
Ford's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' ..... 35&5%
Ohio Tool Co.'s 40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—
Brad Awls:
Handled ..... gro. $2.75@3.00
Unhdled, Shldered ..... gro. 63@66 ¢
Unhandled, Patent ..... gro. 65@70 ¢
Peg Awls:
Unhandled, Patent ..... gro. 31@34 ¢
Unhdled, Shldered ..... gro. 65@70 ¢
Scratch Awls:
Handled, Com ..... gro. $3.50@4.00
Handled, Socket ..... gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights, (up to 3½ lb.)
First Quality $6.50
Second Quality $5.75
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—
See *Grease, Axle*

Axles— *Iron or Steel*
Concord, Loose Collar ..... 4¼@4¾ ¢
Concord, Solid Collar ..... 4¾@5¼ ¢
No. 1 Common, Loose ..... 3¼@3¾ ¢
No. 1½ Com., New Style 3¾@4¼ ¢
No. 2 Solid Collar ..... 4@4½ ¢
Nos. 7, 8, 11 and 12 ..... 75@75&5%
Nos. 13 to 14 ..... 70&10@75&5%
Nos. 15 to 18 ..... 75&10@75&10&5%
Nos. 19 to 22 ..... 75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb., 5¼@5¾ ¢
Common and Concord, turned, lb., 5½@6 ¢
Half Patent ..... lb. 8½@9 ¢

Bait— Fishing—
Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—
Caldwell new list 50%
Pullman ..... 50&10@60%

Spring—
Spring Balances ..... 60@60&5%
Chatillon's:
Light Spg. Balances ..... 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%

Barb Wire— See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb. ..... per lb. 2½@2¾ ¢

Towel
No. 10 Ideal, Nickel Plate ..... ₰ gro. $8.50

Beams, Scale -
Scale Beams ..... 40&10@50%
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₰ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized ..... ₰ doz. $1.75
Western W. G. Co.:
No. 1, Electric ..... ₰ gro. $7.80
No. 2 Buffalo ..... ₰ gro. $9.00
No. 3 Perfection Dust ..... ₰ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned ..... ₰ doz. $1.20
Holt, No. 1, Tinned ..... ₰ doz. $1.50
Holt, No. B, Japanned ..... ₰ doz. $2.00
Holt, No. 2, Tinned ..... ₰ doz. $2.25
Lyon, No. 2, Japanned ..... ₰ doz. $1.25
Lyon, No. 3, Japanned ..... ₰ doz. $1.50
Taplin Mfg. Co.: ₰ gro.
No. 60 Improved Dover $6.00
No. 75 Improved Dover $6.50
No. 100 Improved Dover $7.00
No. 102 Improved Dover, Tin'd $8.50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, T'd $17.00
No. 200 Imp'd Dover Tumbler $8.50
No. 202 Imp'd Dover Tumbler, T'd $9.50
No. 300 Imp'd Dover Mammoth, ₰ doz. $25.00
Western, W. G. Co., Buffalo $7.00
Wonder (S. S. & Co.). ₰ gro. net, $6.00

Bellows—
Blacksmith, Standard List ..... 60&10@70&10%

Blacksmiths'—
Inch	30	32	34	36	38	40
Each	$3.25	3.50	4.00	4.50	5.00	5.75

Extra Length:

Each	$3.75	4.25	4.75	5.25	6.00	7.00

Hand—
Inch	6	7	8	9	10
Doz	$4.50	5.00	5.50	6.00	6.50

Molders—
Inch	9	10	11	12	14
Doz	$8.00	9.00	10.50	12.50	14.50

Net Prices.

Bells— Cow—
Ordinary goods ..... 75&5@75&10&5%
High grade ..... 70&10@70&10&5%
Jersey ..... 15&10%
Texas Star 50%

Door—
Abbe's Gong 45%
Burton Gong 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%
Lever and Pull, Sargent's ..... 60&10&10%
Trip Gong ..... 50&10@50&10&5%
Yankee Gong 55%

Hand—
Hand Bells, Polished, Brass .. 60&5@60&10&5%
White Metal 60%
Nickel Plated ..... 50&10@50&10&5%
Swiss ..... 60@60&7½%
Cone's Globe Hand Bells ..... 33⅓@35%
Silver Chime ..... 33⅓@35%

Miscellaneous—
Farm Bells ..... lb. 2¼ ¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells ..... 50@50&10%

Belting— Leather—
Extra Hvy, Short Lap ..... 60@60&5%
Regular Short Lap ..... 65&10@70%
Standard ..... 70&5@70&10%
Light Standard ..... 70&10@75%
Cut Leather Lacing ..... 60&10%
Leather Lacing Sides, per sq. ft. ..... 17½@18 ¢

Rubber—
Agricultural (Low Grade) .... 75@75&5%
Common Standard ..... 70@70&10%
Standard ..... 65&70%
Extra ..... 60&5@60&10%
High Grade ..... 50&5@50&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 30%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods -
John. S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits -
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks - Tackle—
Common Wooden ..... 70&10@75&5%
Hartz St. Tackle Blocks ..... 50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves ..... 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron ..... 50&10%
Stowell's Self Loading 60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c ..... 30&10@40&10%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co 30½%

Bolts—
Carriage, Machine, &c.—
Common Carriage:
⅝ x 6 and Smaller ..... 75&10@80%
Larger sizes ..... 75@75&5%
Phila. Eagle $3.00 list May 24, '99 ..... 80&10%
Bolt Ends, list Feb. 14, '95. 75@75&5%
Machine, ⅜ x 4 and smaller ..... 75&10&5%
Machine, larger and longer. 75&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.30	.35	.45	.56	.75

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz	$1.15	1.40	2.00

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$0.95	1.25	1.55

Cast Iron Shutter, Japanned, Brass Knobs:

Inch	6	8	10
Per doz	$0.80	.90	1.20

Wrt Barrel Japd ..... 80@80&10%
Wrt " Bronzed ..... 50@50&10%
Wrt. Spring ..... 70&10@70&10&10%
Wrt. Shutter ..... 50&5@50&10&5%
Wrt. Square Neck ..... 75@75&10%
Wrt Square, 66⅔ & 10@66⅔ & 10&10%
Ives' Patent Door 60%

Stove and Plow—
Plow ..... 70&10@70&10&5%
Stove ..... 82½@82½&5%

Tire—
Common 72½%
Norway Iron 80%
American Screw Company:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ..... 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Eclipse, list Dec. 28, '99 ..... 72½%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 72½%
Norway Phila., list Oct., '84 ..... 80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—
Borers Tap, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$4.30	5.00	5.75	7.25

Inch	2¼	2½
Per doz	$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—
C. E. Jennings & Co. 30%
Langdon ..... 15&10%
Perfection ..... ₰ doz. $30.00
Schatz 40%

Braces—
Common Ball, American $1.15@1.25
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat. 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat. 60&10@65%

Brackets—
Wrought Steel ..... 80&10@80&10&5%
Bradley's Wire Shelf:
Full cases ..... 80&10&10%
Broken cases ..... 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets ..... 70&10%
Stowell's Cast Shelf 75%
Stowell's Sink 50%
Western, W. G. Co., Wire ..... 60&10%

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Western, W. G. Co. 80%
Wire Goods Co. ..... 75@75&10%

Buckets, Galvanized—
Price per dozen.

Quart	10	12	14
Water, Regular	1.40	1.70	1.90
Water, Heavy	3.40	3.70	3.80
Fire, Rd. Bottom	2.30	2.55	2.95
Well	2.55	2.87	3.15

Bucks, Saw—
Hoosier ..... ₰ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—
Wrought, list Sept., '96 ..... 30%
Cast Brass, Tiebout's 50%

Cast Iron—
Fast Joint, Broad ..... 40&10@50%
Fast Joint, Narrow ..... 40&10@50%
Loose Joint ..... 70&5@75%
Loose Pin ..... 70&5@75%
Mayer's Hinges ..... 70&5@75%
Parliament Butts ..... 70&5@75%

Wrought Steel—
Table and Back Flaps 75%
Narrow and Broad 75%
Inside Blind ..... 75&10%
Loose Pin 75%
Loose Pin, Ball and Steeple Tip ..... 50&20%
Japanned Ball Tip Butts ..... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts ..... 55&10%

Cages, Bird—
Hendryx Brass:
3000, 5000, 1100 series 60%
1200 series ..... 60&10%
200, 300, 600 and 900 series ..... 60&10%
Hendryx Bronze:
700, 800 series ..... 60&10%
Hendryx Enameled ..... 60&10%

LB My '05

VOLUME

TIGHTLY BOUND

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AVAILABLE